United Nations FCCC/ARR/2017/BLR

Framework Convention on Climate Change

Distr.: General
22 June 2018

English only

Report on the individual review of the inventory submission of Belarus submitted in 2017*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). This report presents the results of the individual inventory review of the 2017 inventory submission of Belarus, conducted by an expert review team in accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories". The review took place from 18 to 23 September 2017 in Bonn, Germany.

* In the symbol for this document, 2017 refers to the year in which the inventory was submitted, not to the year of publication.

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Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AD	activity data
ARR	annual review report
Belstat	National Statistical Committee of the Republic of Belarus
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CRF	common reporting format
DOC	degradable organic carbon
EF	emission factor
ERT	expert review team
$Frac_{GASM}$	fraction of livestock N that volatilizes as ammonia and nitrogen oxides from manure
$Frac_{LOSS}$	fraction of managed manure N for livestock that is lost in each system
GHG	greenhouse gas
HFC	hydrofluorocarbon
HWP	harvested wood products
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*
IPCC good practice guidance for LULUCF	*Good Practice Guidance for Land Use, Land-Use Change and Forestry*
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
MCF	methane correction factor
MMS	manure management system
MSW	municipal solid waste
N	nitrogen
NA	not applicable
NCV	net calorific value
NE	not estimated
Nex	nitrogen excretion
NF_3	nitrogen trifluoride
NIR	national inventory report
NMVOC	non-methane volatile organic compound
NO	not occurring
N_2O	nitrous oxide
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
Revised 1996 IPCC Guidelines	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
SF_6	sulfur hexafluoride
SWDS	solid waste disposal site
UNFCCC	United Nations Framework Convention on Climate Change
UNFCCC Annex I inventory	"Guidelines for the preparation of national communications by Parties

reporting guidelines	included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"
UNFCCC review guidelines	"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention"
Wetlands Supplement	*2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*

I. Introduction

1. This report covers the review of the 2017 inventory submission of Belarus organized by the secretariat, in accordance with the UNFCCC review guidelines, particularly in part III thereof, namely the "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention" (decision 13/CP.20). The review took place from 18 to 23 September 2017 in Bonn, Germany, and was coordinated by Ms. Veronica Colerio, Mr. Roman Payo and Mr. Davor Vesligaj (secretariat). Table 1 provides information on the composition of the ERT that conducted the review of Belarus.

Table 1
Composition of the expert review team that conducted the review of Belarus

Area of expertise	*Name*	*Party*
Generalist	Ms. Elena Gavrilova	The former Yugoslav Republic of Macedonia
	Ms. Kristina Saarinen	Finland
Energy	Ms. Veronika Ginzburg	Russian Federation
	Mr. Giorgi Mukhigulishvili	Georgia
	Mr. Dingane Sithole	Zimbabwe
	Mr. Hongwei Yang	China
IPPU	Ms. Emma Salisbury	United Kingdom of Great Britain and Northern Ireland
	Mr. Koen Smekens	Belgium
	Mr. Glen Thistlethwaite	United Kingdom
Agriculture	Ms. Laura Cardenas	United Kingdom
	Ms. Yue Li	China
	Mr. Asaye Ketema Sekie	Ethiopia
LULUCF	Mr. Craig Elvidge	New Zealand
	Mr. Agustin Inthamoussu	Uruguay
	Ms. Thelma Krug	Brazil
	Mr. Harry Vreuls	Netherlands
Waste	Mr. Cristobal Felix Diaz Morejon	Cuba
	Mr. Pavel Gavrilita	Republic of Moldova
	Mr. Igor Ristovski	The former Yugoslav Republic of Macedonia
Lead reviewers	Ms. Saarinen	
	Ms. Gavrilova	

2. The basis of the findings in this report is the assessment by the ERT of the consistency of the Party's 2017 inventory submission with the UNFCCC review guidelines. The ERT has made recommendations that Belarus resolve the findings related to issues.[1] Other findings and, if applicable, the encouragements by the ERT to Belarus to resolve them, are also included.

[1] Issues are defined in decision 13/CP.20, annex, paragraph 81.

3. A draft version of this report was communicated to the Government of Belarus, which provided no comments.

4. An overview of the GHG emissions reported under the Convention for Belarus is provided in annex I; table 6 shows GHG emissions with and without indirect CO_2 emissions for selected years, and tables 7 and 8 show GHG emissions reported under the Convention by gas and by sector, respectively.

II. Summary and general assessment of the 2017 inventory submission

5. Table 2 provides the assessment by the ERT of the inventory submission with respect to the tasks undertaken during the review. Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5.

Table 2
Summary of review results and general assessment of the inventory of Belarus

Assessment			*Issue or problem ID#(s) in table 3 and or 5[a]*
Date of submission	Original submission: 1 June 2017 (NIR), 1 June 2017, version 10 (CRF tables)		
Review format	Centralized		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	Have any issues been identified in the following areas:		
	(a) Identification of key categories	Yes	G.11, G.17
	(b) Selection and use of methodologies and assumptions	Yes	G.8, E.16, E.29, E.34, I.3, W.2, W.10
	(c) Development and selection of EFs	Yes	E.2, E.6, E.14, E.17, E.21, E.27, E.42, E.44, I.26, W.8, W.13
	(d) Collection and selection of AD	Yes	E.13, E.22, E.37, E.41, E.43, I.7, I.8, A.10, A.15, A.16, A.18, A.20, A.31, W.7, W.8, W.14, W.17
	(e) Reporting of recalculations	Yes	G.15, G.16, E.30
	(f) Reporting of a consistent time series	Yes	I.15, I.19, W.7, W.15
	(g) Reporting of uncertainties, including methodologies	Yes	G.13, G.23, A.3, A.27, A.38, L.1
	(h) QA/QC	Yes	G.5, G.10, G.18, G.24, E.5, E.11, E.20, E.24, E.25, A.17, A.35, L.1, W.8
	(i) Missing categories/completeness[b]	Yes	G.3, E.22, E.25, E.31, E.38, E.39, I.4, I.11, I.25, I.26, A.9, L.1, L.6, L.14, W.1, W.4, W.16
	(j) Application of corrections to the inventory	No	

Assessment			*Issue or problem ID[a](s) in table 3 and/or 5[a]*
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	The Party did not report "NE" for any insignificant categories	
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	No	G.16, G.18, I.13
National inventory arrangements	Have any issues been identified with the effectiveness and reliability of the institutional, procedural and legal arrangements for estimating GHG emissions, including the changes to the national inventory arrangements since the previous annual submission?	Yes	G.1, G.7, G.10
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?	Yes	
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No	

[a] The ERT identified additional issues in the energy, IPPU, agriculture, LULUCF and waste sectors that are not listed in this table but are included in table 3 and/or 5.

[b] Missing categories for which methods are provided in the 2006 IPCC Guidelines may affect completeness and are listed in annex II.

III. Status of implementation of issues raised in the previous review report

6. Table 3 compiles all the recommendations made in previous review reports that were included in the previous review report, published on 7 March 2017.[2] For each issue, the ERT specified whether it believes the issue has been resolved by the conclusion of the review of the 2017 inventory submission and provided the rationale for its determination, which takes into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues raised in the previous review report of Belarus

ID[a]	*Issue classification[b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	Inventory submission (G.1, 2016) (G.1, 2015) (6, 2013) Adherence to the UNFCCC Annex I inventory reporting guidelines	Submit inventories by 15 April each year as required by decision 18/CP.8.	Not resolved. Belarus submitted the 2017 inventory submission on 1 June 2017. As stated by the Party, the delay was caused by the prolonged QA procedure for adoption of the report by the Ministry of Natural Resources and Environmental Protection.

[2] FCCC/ARR/2016/BLR.

ID[a]	*Issue classification[b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
G.2	NIR (G.2, 2016) (G.2, 2015) (7, 2013) Adherence to the UNFCCC Annex I inventory reporting guidelines	Provide the missing sections in the NIR following the structure outlined in the UNFCCC reporting guidelines.	Not resolved. The Party has made some efforts to align the reporting with the UNFCCC Annex I inventory reporting guidelines. However, chapter 9 "Indirect CO_2 emissions", chapter 10 "Recalculations and improvements" and annex 3 to the NIR "Detailed methodological description for individual sources or sink categories" were still not provided.
G.3	Activity data (G.3, 2016) (G.3, 2015) (table 3, 2013) (8, 2012) Completeness	Collect AD and estimate emissions for all categories and subcategories which are currently reported as "NE", but for which the IPCC provides estimation methods.	Addressing. Belarus has improved the completeness of the inventory by reporting the following categories: (a) CH_4 emissions from natural gas distribution (1.B.2.b.5) for the entire time series; (b) CO_2 emissions from non-metallurgical magnesium were reported as "NO" (they were previously reported as "NE"); (c) N_2O emissions from 3.D.a.5 mineralization/immobilization associated with loss/gain of soil organic matter for 1993, 1998 and 2015; (d) CO_2 emissions from category 3.H urea application for the entire time series; (e) CH_4 emissions from industrial wastewater for the entire time series. The ERT notes that there are no methods in the 2006 IPCC Guidelines to estimate CO_2 emissions from flooded lands remaining flooded lands and other land remaining other land, CH_4 emissions from settlements remaining settlements and land converted to settlements, CO_2 emissions from managed waste disposal sites, N_2O emissions from anaerobic digestion at biogas facilities, and N_2O emissions from industrial wastewater. In its 2017 GHG inventory submission, mainly owing to a lack of AD, Belarus still reports a considerable number of categories for which the IPCC provides estimation methods as "NE" (actual estimates were not reported), "NO" (actual estimates were reported as not occurring, but the ERT determined that they may be occurring), "NA" (actual emissions were reported as not applicable, but the ERT determined them as being applicable) and "IE" (actual estimates were not reported, and were not reported elsewhere (i.e. they were missing)), or leaves blank cells instead of using notation keys or reporting estimates. The list of categories for which the use of the notation keys and the reporting of information are not in line with the UNFCCC Annex I inventory reporting guidelines, and therefore for which Belarus has not resolved the completeness issue, is as follows: (a) In the energy sector: CO_2, CH_4 and N_2O emissions from category 1.B.2.a.1 exploration (oil) ("NO" was reported for the period 1990–2014 and the cells were left blank for 2015); CO_2 and CH_4

ID#	Issue classification[a]	Recommendation made in previous review report	ERT assessment and rationale
			emissions from category 1.B.2.b.1 exploration (natural gas) ("NO" was reported for the period 1990–2014 and the cells were left blank for 2015); CO_2 and CH_4 emissions from category 1.B.2.b.3 processing (natural gas) ("NO" was reported for the period 1990–2014 and the cells were left blank for 2015); and CO_2, CH_4 and N_2O emissions from category 1.B.2.c venting and flaring ("NA" was reported for the period 1990- 2014 and the cells were left blank for 2015); (b) In the IPPU sector: CO_2 emissions from categories 2.A.4.a ceramics, 2.D.1 lubricant use and 2.D.2 paraffin wax use ("NE"); CO_2, CH_4 and N_2O from category 2.D non-energy products from fuels and solvents use; and HFC, PFC, SF_6 and NF_3 emissions from category 2.F product uses as substitutes for ozone-depleting substances ("NA" and cells were left blank), 2.F.1 refrigeration and air conditioning, 2.F.2 foam blowing agents, 2.F.3 fire protection and 2.F.4 aerosols); (c) In the agriculture sector: CH_4 and N_2O emissions from asses under categories 3.A.4 other livestock and 3.B.4 other livestock; CH_4 emissions from manure management from category 3.B(a)s1 volatile solids, and maximum methane-producing capacity for manure for fur-bearing animals ("NE"); (d) In the LULUCF sector: (i) CO_2 emissions and removals from categories 4.A.2.1 cropland converted to forest land ("NE"), 4.A.2.2 grassland converted to forest land ("NE") 4.A.2.3 wetlands converted to forest land ("NE"), 4.A.2.5 other land converted to forest land ("NE", although areas are now reported in the 2017 inventory submission), 4.B.2.1 forest land converted to cropland ("NE"), 4.B.2.2 grassland converted to cropland ("NE"), 4.B.2.3 wetlands converted to cropland ("NE"), 4.B.2.4 settlements converted to cropland ("NE"), 4.B.2.5 other land converted to cropland ("NE"), 4.C.2.1 forest land converted to grassland ("NE"), 4.C.2.2 cropland converted to grassland ("NE"), 4.C.2.3 wetlands converted to grassland ("NE"), 4.C.2.5 other land converted to grassland ("NE"), 4.D.1.3 other wetlands remaining other wetlands ("NE"), 4.D.2.3 land converted to other wetlands ("NE", although area is now reported in the 2017 inventory submission), 4.E.1 organic soils on settlements remaining settlements ("NE"), 4.E.2 land converted to settlements ("NE"), 4.F.2 land converted to other land ("NE") and 4.G harvested wood products ("NE"); (ii) N_2O emissions from categories 4.B.2 land converted to cropland ("NO"), 4.C.2 land converted to grassland ("NE", "NO"), 4.D.1 wetlands remaining wetlands ("NE", "NA", "NO"), 4.E.1 settlements remaining settlements ("NE"), 4.E.2 land converted to settlements ("NE", "NO") and 4.F other land ("NE");

ID#	*Issue classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			(iii) CO_2, CH_4 and N_2O emissions and removals from category 4(II) drainage and rewetting and other management of organic and mineral soils ("NE", "NO"); (e) In the waste sector: CH_4 emissions from category 5.A.1 managed waste disposal sites ("NO"); CH_4 and N_2O emissions from category 5.B.1 composting and CH_4 emissions from 5.B.2 anaerobic digestion at biogas facilities ("NO"); CO_2, CH_4 and N_2O emissions from category 5.C incineration and open burning of waste ("NO"); and CH_4 emissions from category 5.D.1 domestic wastewater ("NE"). The Party has made efforts to collect more disaggregated AD via Belstat and some enterprises and it will continue to work on this issue.
G.4	Recalculations (G.4, 2016) (G.4, 2015) (table 3, 2013) Consistency	Undertake recalculations for all years of the time series.	Resolved. The Party has provided a complete time series of recalculated estimates in the 2017 submission (categories 1.B.2, 2.A, 2.B, 2.C, 3.A, 3.B, 3.D, 4.A, 4.B, 5.A and 5.D).
G.5	QA/QC and verification (G.5, 2016) (G.5, 2015) (table 3, 2013) (19, 2012) Adherence to the UNFCCC Annex I inventory reporting guidelines	Put in place robust QA/QC procedures and report complete and detailed information on sectoral QA/QC procedures in the NIR, in particular for the key categories.	Not resolved. In the light of the number of issues identified during the review, the ERT notes that robust and comprehensive QA/QC procedures have not been implemented for the preparation of the inventory. Furthermore, complete and detailed information on general sectoral or key category QA/QC procedures in line with the 2006 IPCC Guidelines (volume 1, chapter 6) has not been provided in the NIR.
G.6	Methods (G.6, 2016) (G.6, 2015) (table 3, 2013) (23, 2012) Transparency	Include in the NIR more information to explain the methodologies and procedures used in the calculations, a description of the data-collection process and more data tables to present the AD and EFs that have been used, as well as provide background information on all AD used in the inventory, specifically for the energy and industrial processes sectors.	Addressing. The transparency aspects of the reporting of methodologies and procedures have improved in the latest submission of Belarus. During the review, the Party stated that it will continue to improve the transparency of its reporting by providing detailed information on the methodologies used for the estimates, the data-collection process and the parameters used.
G.7	Inventory management (G.7, 2016) (G.7, 2015) (11, 2013) (26, 2012) Transparency	Include in the NIR information on the personnel involved in the development and management of the inventory in order to demonstrate sufficient levels of capacity and expertise to undertake the various tasks and roles within the inventory team.	Not resolved. Relevant information was not provided in the NIR. During the review, the Party provided a list of personnel engaged in the inventory compilation process, although it did not provide a detailed description of the tasks and specific expertise per expert in order to demonstrate that there is sufficient capacity and expertise to undertake the various tasks and roles within the inventory team.

ID#	*Issue classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
G.8	Inventory planning (G.8, 2016) (G.8. 2015) (12, 2013) (27, 2012) Accuracy	Enhance efforts to implement improvements to the inventory by using higher-tier estimation methods and country-specific EFs for key categories, in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF.	Addressing. The ERT noted that despite repeated recommendations made in several previous review reports for the Party to use higher-tier methods and country-specific EFs, the Party uses higher-tier estimation methods and country-specific EFs only in the estimation of the emissions from the following subcategories which are considered as key categories: 2.A.1 and 2.B.1 – CO_2 emissions; 3.A – CH_4 emissions; and 3.B – CH_4 and N_2O emissions. The rest of the key categories are still estimated using a tier 1 approach and default EFs. The Party stated that, where possible, it will make efforts to apply higher-tier estimation methods, but it has difficulties in conducting extensive scientific studies (for further details, see the sectoral findings in table 3).
G.9	Inventory planning (G.9, 2016) (G.9, 2015) (12, 2013) (13, 2012) Accuracy	Report in the NIR a delivery deadline for each of the planned improvements.	Resolved. The delivery deadlines for planned improvements have been reported in annex 2 to the NIR.
G.10	QA/QC and verification (G.10, 2016) (G.10, 2015) (13, 2013) (19, 2012) Transparency	Report complete and detailed information on sectoral QA/QC procedures in the NIR, in particular for the key categories, and use the information available on internal and external reviews to help develop the section of the NIR that describes the QA/QC procedures undertaken.	Not resolved. Complete and detailed information on general sectoral or key category QA/QC procedures, in line with the 2006 IPCC Guidelines (volume 1, chapter 6) has not been provided in the NIR. The Party explained that it will make efforts to report on QA/QC procedures for the key categories in future submissions.
G.11	Key category analysis (G.11, 2016) (G.11, 2015) (table 4, 2013) Adherence to the UNFCCC Annex I inventory reporting guidelines	Undertake a key category analysis following the IPCC good practice guidance.	Not resolved. The key categories were identified in the CRF tables using approach 1, key category assessment (including the level and trend assessment), which is in line with the 2006 IPCC Guidelines (volume 1, chapter 4). The ERT noted that although Belarus reported tables 4.2 and 4.3 of the 2006 IPCC Guidelines in its 2016 inventory submission, the key category assessment presented in the 2017 NIR is not in line with the UNFCCC Annex I inventory reporting guidelines since only the level assessment was presented (see ID# G.22 in table 5).
G.12	Inventory planning (G.12, 2016) (G.12, 2015) (table 4, 2013) (13, 2012) Transparency	Report in the NIR whether the Party uses the key category analysis in the prioritization of developments in and improvements to its inventory.	Not resolved. The Party did not report in the NIR whether it uses the key category analysis for the prioritization of developments in and improvements to its inventory.
G.13	Uncertainty analysis (G.13, 2016) (G.13, 2015) (table 4, 2013) (14, 2012) Adherence to the	Include an explanation for the observed changes in the reported uncertainty estimates between inventory submissions in the NIR; use only well-documented	Not resolved. Belarus has not provided an estimate of the cumulative uncertainty of the total GHG emissions for 2015 in line with the UNFCCC Annex I inventory reporting guidelines, paragraph 50(g), nor has it provided information on how the uncertainty analysis was used to prioritize inventory

ID[a]	Issue classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	UNFCCC Annex I inventory reporting guidelines	country-specific values for parameters in the uncertainty analysis; and report how the uncertainty analysis is used to prioritize inventory improvements.	improvements. Also, the values for the parameters used in the uncertainty analysis have not been adequately documented.
G.14	Inventory management (G.14, 2016) (G.14, 2015) (15, 2013) (25 2012) Adherence to the UNFCCC Annex I inventory reporting guidelines	Include in the NIR an updated version of the inventory improvement plan, which covers all recommendations made in the current and previous review reports.	Resolved. Annex 2 to the NIR contains information on the planned improvements for 2017. The Party explained that it will include an updated improvement plan in the 2018 submission, as well as the results of the previous plan with all performed improvements.
G.15	Recalculations (G.16, 2016) (G.15, 2015) Comparability	Report CRF tables on recalculations with all the necessary information fully in accordance with the UNFCCC Annex I inventory reporting guidelines and using the agreed tables included in decision 24/CP.19, annex II.	Addressing. The Party reported the recalculations in CRF table 8 of the 2017 submission, although the reporting is not fully in accordance with the UNFCCC Annex I inventory reporting guidelines since the table contains blank cells.
G.16	Recalculations (G.17, 2016) (G.17, 2015) Transparency	Report in the NIR complete information on the recalculations relating to previously submitted inventory data, in particular in relation to recalculations made in response to the review process and include a discussion on the impact of the recalculations on the trend of emissions.	Addressing. In the NIR, the Party provided in most instances very limited and mostly qualitative information on recalculations relating to previously submitted inventory data and in response to the previous review reports.
G.17	Key category analysis (G.18, 2016) (G.18. 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Ensure better consistency between the key category analysis reported in the NIR and the CRF tables and correct, as necessary, the key category analysis reported in the NIR.	Not resolved. The key category assessment reported in the NIR is not consistent with the key category assessment reported in CRF table 7. The ERT noted that there may be reasons for differing results in the key category analysis between the NIR and the CRF tables (e.g. depending on the level of category aggregation at which the key category analysis was done, or the inclusion of a qualitative assessment in the NIR) but in the case of Belarus the reasons for the differences have not been described.
G.18	QA/QC and verification (G.19, 2016) (G.19, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Improve the QC procedures to ensure consistency in the information presented in the CRF tables and the NIR for the different gases and sectors and provide more extensive information on the reasons for observed trends of emissions across the time series at the sectoral level and for the most important categories within	Addressing. The ERT noted that the consistency of the CRF tables and the NIR has been improved, suggesting that QC procedures have been improved as well, but the ERT still identified a number of inconsistencies between the reporting in the NIR and the CRF tables. Furthermore, the reporting on the changes in the trends is still not transparent and in line with the UNFCCC Annex I inventory reporting guidelines.

ID[a]	Issue classification[b]	Recommendation made in previous review report	ERT assessment and rationale
		these sectors.	
Energy			
E.1	1. General (energy sector) – all fuels – all gases (E.1, 2016) (E.1, 2015) (20, 2013) (32, 2012) Transparency	Improve transparency and include detailed information on EFs and AD in the NIR, for example by including summary tables of the AD and EFs used for the inventory estimations together with a clear description of the sources thereof, and by providing clear indications of the methodology used.	Not resolved. The NIR still did not include any detailed information on the AD and EFs used for the inventory estimations according to the disaggregation of categories provided in the 2006 IPCC Guidelines. This issue was included in the 2017 national improvement plan (NIR, appendix 2) and according to that plan the Party intended to resolve it for the 2017 annual submission, but according to the response provided by the Party during the review, it has been postponed to 2018.
E.2	1. General (energy sector) – all fuels – all gases (E.2, 2016) (E.2, 2015) (21, 2013) (44, 2012) Accuracy	Where possible, use country-specific EFs for key categories.	Not resolved. Belarus continued to use IPCC default EFs to calculate GHG emissions from most fuels and key categories.
E.3	1. General (energy sector) – all fuels – all gases (E.3, 2016) (E.3, 2015) (22, 2013) Adherence to the UNFCCC Annex I inventory reporting guidelines	Implement tier 2 QC procedures for all key categories in the energy sector.	Resolved. The ERT noted that Parties are no longer required to implement tier 2 QC procedures.
E.4	1. General (energy sector) – all fuels – all gases (E.4, 2016) (E.4, 2015) (22, 2013) (33, 2012) Transparency	Include in the NIR detailed information on data management and handling.	Not resolved. The Party informed the ERT that detailed information on data management and handling is under preparation; however, it has still not been reported in the NIR.
E.5	1. General (energy sector) – all fuels – all gases (E.5, 2016) (E.5, 2015) (23, 2013) Transparency	Implement QC procedures to ensure the correct and consistent use of notation keys.	Not resolved. The ERT noted that the use of certain notation keys still remains inconsistent, suggesting that QC procedures have not been implemented: (a) In CRF table 1.A(a), for 2015, "NO" is used for all gases under category 1.A.1.b petroleum refining, although CRF table 1.B.2 contains data on 973.01 PJ of oil allocated to oil refining/storage. Furthermore, the statistical data of Belarus state that gasoline and diesel fuels are produced in the country; (b) In CRF table 1.A(a), "IE" is used to report the AD and emissions from category 1.A.2.b non-ferrous metals (all fuels), and from 1.A.2.g.i. manufacturing of machinery (peat) but no explanatory information is

ID#	Issue classification[a]	Recommendation made in previous review report	ERT assessment and rationale
			provided in CRF table 9 or the NIR; (c) In the NIR (p.32) Belarus reported on the adoption of national EFs for carbon monoxide and nitrogen oxides from road transportation, and indicated that there are emissions of SO_2 and NMVOCs from road transportation; nevertheless, in CRF table 1 "NO" was used for all indirect emissions from road transportation; (d) In CRF table 1.A(a) for the category1.A.4.cii off-road vehicles and other machinery "NO" was used; (e) CRF table 1.A(b) reported imports of 52.0 TJ of coke oven/gas coke for 2015, but in the same time "NO" was used for reporting actual CO_2 emissions; (f) In the NIR (p.35) Belarus indicated that jet kerosene is used only for international flights and aviation gasoline mainly for small aircraft (domestic aviation), while in CRF table 1.A(a), cells for AD and emissions from aviation gasoline are blank. The ERT noted also that there is still a lack of transparency regarding the reason for the changes of notation keys made by the Party for certain categories. For example, in the 2014 GHG inventory submission, in CRF table 1.A(d), for feedstocks and non-energy use of fuels, the AD for coal oils and tars were reported as "NO", but the fraction of carbon stored was reported as "NA" and the carbon stored was reported as "NE". In the 2017 GHG inventory submission the notation key "NO" was used for all the above-mentioned categories, and no explanatory information was provided in the NIR on the reasons of such changes. Furthermore, there is still a lack of transparency regarding the reason for the changes of notation keys made by the Party for certain categories as well as clear information on what changes of notation keys have been made (see ID# E.36 in table 5).
E.6	1.A.3.b Road transportation – liquid and gaseous fuels – CH_4 and N_2O (E.6, 2016) (E.6, 2015) (24, 2013) Accuracy	Use appropriate CH_4 and N_2O EFs to estimate emissions from road transportation.	Not resolved. The ERT noted that the IEF values reported in CRF table 1.A(a)s3 for CH_4 and N_2O emissions from road transportation are not in line with those provided in the 2006 IPCC Guidelines. The Party used the default EF for CH_4 from the 2006 IPCC Guidelines for vehicles with oxidation catalyst to estimate both CH_4 and N_2O emissions (25 kg/TJ) for all vehicles, without providing an explanation in the NIR for the choice of this EF.
E.7	Fuel combustion – reference approach – all fuels – CO_2 (E.7, 2016) (E.7, 2015) (26, 2013) (35, 2012) Transparency	Investigate and explain in the NIR and the CRF tables the reasons for the observed difference between the reference approach and the sectoral approach.	Not resolved. The NIR still does not contain information on the reasons for the observed differences between the sectoral and reference approaches (see ID#s E.25 below and E.45 in table 5).

ID[a]	Issue classification[b]	Recommendation made in previous review report	ERT assessment and rationale
E.8	Fuel combustion – reference approach – liquid fuels – CO_2 (E.8, 2016) (E.8 2015) (27, 2013) Accuracy	Categorize refinery gas as a liquid fuel.	Resolved. Refinery gas is considered in the reference approach as a secondary liquid fuel. According to the national statistical data, the apparent consumption of the refinery gas is equal to its production, so no data on refinery gas are included in the reference approach estimates.
E.9	Comparison with international data – all fuels – CO_2 (E.9, 2016) (E.9, 2015)(28, 2013) (41, 2012) Transparency	Include in the NIR a comparison of the fuel data used in the inventory and the corresponding IEA data, clarifying the reasons for any significant differences.	Not resolved. The NIR does not include a comparison of the fuel data used in the inventory estimates and the corresponding IEA data. The reasons for any significant differences were not clarified.
E.10	International aviation – liquid fuels – all gases (E.10, 2016) (E.10, 2015) (29, 2013) (42, 2012) Transparency	Provide information in the NIR on how jet kerosene is allocated between domestic and international flights for the period 2000–2011.	Not resolved. The NIR still does not provide enough transparent and consistent information on the methodology, AD, sources of information and assumptions used for allocating jet kerosene consumption between domestic and international flights for the period 2000–2011. It was noted in the 2016 ARR that the national fuel and energy balance provides information on overall fuel consumption of jet kerosene for the "transport and communications sector" without distributing the consumption between domestic and international aviation. However, CRF tables 1, 1.A(a), 1.A(b) and 1.D provide separate emission estimates for jet kerosene consumption for domestic aviation and international bunkers for the entire time series.
E.11	International bunkers and multilateral operations – liquid fuels – all gases (E.11, 2016) (E.11, 2015) (30, 2013) Consistency	Enhance QC procedures to ensure the consistency of the data reported between CRF tables 1.A(b) and 1.C (1.D for the 2017 CRF tables).	Resolved. Data for international bunker fuels are provided in different units: in CRF table 1.A(b) in kt (although it should be reported in TJ in this table); and in CRF table 1.D in TJ. The ERT also noted that when applying the conversion factor 44.10 TJ/unit for transferring data from kt to TJ, the amount of jet kerosene allocated for international bunkers is consistent in CRF tables 1.A(b) and 1.D and therefore these data are consistent.
E.12	Feedstocks, reductants and other non-energy use of fuels – all fuels – CO_2 (E.12, 2016) (E.12, 2015) (31, 2013) Adherence to the UNFCCC Annex I inventory reporting guidelines	Ensure consistency between CRF tables 1.A(b), 1.A(c) and 1.A(d).	Addressing. The ERT appreciates the efforts made by the Party to improve consistency between CRF tables 1.A(b) and 1.A(c) by providing information in CRF table 1.A(b) for carbon excluded owing to non-energy use of crude oil, gasoline, gas/diesel oil, residual fuel oil, natural gas and lignite. However, the inconsistencies between CRF tables 1.A(b), 1.A(c) and 1.A(d) still exist. CRF table 1.A(b) reports information on the amount of excluded carbon for crude oil, gasoline, gas/diesel oil, residual fuel oil, lignite and natural gas. CRF table 1.A(d) also reports non-energy use of other kerosene and oil shale, while in CRF table 1.A(b), the carbon excluded for these fuels is reported as "NA" and "NO". The amounts of carbon excluded from the reference approach reported in CRF tables 1.A(b) and 1.A(c) are consistent only for crude oil and residual fuel oil; for all other fuels the data reported in CRF tables 1.A(b)

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			and 1.A(c) are inconsistent. The data on apparent energy consumption excluding non-energy use are not reported in CRF table 1.A(d).
E.13	Feedstocks, reductants and other non-energy use of fuels – all fuels – CO_2 (E.13, 2016) (E.13, 2015) (32, 2013) (43, 2012) Accuracy	Obtain information on the utilization of naphtha, lubricants, coal and coal products as feedstocks and for non-energy purposes; use this information to improve the accuracy of emission estimates; and provide detailed relevant explanations in the NIR to improve transparency.	Not resolved. The data on the use of naphtha, lubricants, coal and coal products as feedstocks and for non-energy purposes are not included in CRF table 1.A(d) (the notation key "NO" is reported). The ERT also noted that detailed relevant information was not provided in the NIR.
E.14	1.A. Fuel combustion – sectoral approach – all fuels – CO_2 (E.14, 2016) (E.14, 2015) (33, 2013) (44, 2012) Accuracy	Follow the IPCC good practice guidance for key categories under stationary combustion and use country-specific carbon contents for all fuels.	Addressing. Country-specific CO_2 EFs are used for the emissions inventory for the category 1.A.1 energy industries. However, in CRF table Summary3s1, the Party reported that default EFs are used for all categories of fuel combustion. The ERT also noted that the Party continued to use default EFs from the 2006 IPCC Guidelines to calculate GHG emissions from other key categories and is therefore not following the requirements of the 2006 IPCC Guidelines, which are the same as those contained in the IPCC good practice guidance (see also ID# E.40 in table 5).
E.15	1.A. Fuel combustion – sectoral approach – solid fuels – all gases (E.16, 2016) (E.16, 2015) (35, 2013) (45, 2012) Transparency	Explain in more detail the derivation of the country-specific NCVs for solid fuels and provide a justification for their use.	Addressing. Some clarifying information on the derivation of the country-specific NCVs for solid fuels was provided by the Party during the review. However, there is still no information in the NIR describing the methodology used to develop country-specific NCVs for solid fuels as well as justification that the country-specific NCVs better reflect the national circumstances.
E.16	1.A.2 Manufacturing industries and construction – all fuels – CO_2, CH_4 and N_2O (E.17, 2016) (E.17, 2015) (36, 2013) (46, 2012) Adherence to the UNFCCC Annex I inventory reporting guidelines	Report disaggregated emission data by subcategory under manufacturing industries and construction and reallocate the emissions from petroleum refining and manufacture of solid fuels and other energy industries to the energy industries category.	Not resolved. According to the 2016 ARR, the emissions from petroleum refining were allocated under manufacturing industries and construction (1.A.2) and because of the structure of the energy balance, the notation key "NO" was mistakenly used for "petroleum refining" (1.A.1.b), where the notation key "IE" should have been used. However, the 2017 CRF table 1.A(a)s1 still reports emissions from petroleum refining as "NO". Responding to a question concerning the lack of data reported for oil refining, the Party informed the ERT that requests for obtaining the disaggregated data were sent to the relevant authorities and the emissions will be reallocated in the next GHG inventory submission.
E.17	1.A.3.b Road transportation – liquid fuels – CO_2 (E.19, 2016) (E.19 2015) (38, 2013) (48, 2012)	Use country-specific EFs to estimate emissions for this key category.	Not resolved. In its 2017 GHG inventory submission, Belarus used default EFs to estimate CO_2 emissions from liquid fuels for category 1.A.3.b road transportation; therefore, the Party is still using a tier 1 methodology.

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	Accuracy		
E.18	1.B.2.b Natural gas – gaseous fuels – CH_4 (E.21, 2016) (E.21, 2015) (40, 2013) Transparency	Include in the NIR data on the volume of gas transmission (including any transit amounts) to improve transparency.	Not resolved. The AD for natural gas transmission/storage were not included in the NIR. The Party explained that the AD will be reported in the next submission (see ID#s E.35, E.36 below and E.44 in table 5).
E.19	1.B.2.b Natural gas – gaseous fuels – CH_4 (E.23, 2016) (E.23, 2015) (42, 2013) (50, 2012) Transparency	Report CH_4 emissions under the distribution of natural gas.	Resolved. CH_4 emissions under the distribution of natural gas are reported in the CRF tables of the 2017 submission for the whole time series. However, no information has been provided in the NIR on the AD, EFs and methodology used for this category (see ID#s E.35, E.36 below and E.44 in table 5).
E.20	1.B.2 Oil and natural gas and other emissions from energy production– liquid and gaseous fuels – CH_4 (E.25, 2016) (E.25, 2015) (44, 2013) Adherence to the UNFCCC Annex I inventory reporting guidelines	Develop QC procedures for the oil and natural gas category, in order to ensure the accuracy of estimates, time-series consistency, the correct use of the notation keys and the transparency of the information provided in the NIR.	Not resolved. The NIR did not include any information on QC procedures developed and/or implemented for category 1.B.2 oil, natural gas and other emissions from energy production.
E.21	1.A.3.b Road transportation – liquid fuels – CH_4 and N_2O (E.26, 2016) (E.26, 2015) (45, 2013) (53, 2012) Accuracy	Use the correct value of CH_4 EF for liquefied petroleum gas and revise the N_2O emission estimates using appropriate N_2O EFs, considering also the possibility of estimating the amount of fuel used by vehicle type and the number of vehicles equipped with catalytic convertors.	Not resolved. The initial recommendation from the 2013 ARR (para. 45) was about default EFs from the Revised 1996 IPCC Guidelines. The use of correct EFs for CH_4 and N_2O is considered in ID#s E.6 above and E.42 in table 5.
E.22	1.B.2 Oil and natural gas and other emissions from energy production– liquid and gaseous fuels – CO_2 (E.30, 2016) (E.30, 2015) (47, 2013) Completeness	Collect data to allow the estimation and reporting of all associated emissions.	Not resolved. The initial recommendation from the 2013 ARR was made in accordance with the Revised 1996 IPCC Guidelines when there was no data, and fugitive CO_2 emissions from oil and gas systems were reported as "NA" or "NO" for all subcategories except combined flaring. The ERT noted that, in addition to the categories identified in ID# G.3 above, the CO_2 emissions from oil and gas operations are not reported for categories 1.B.2.a.5 distribution of oil products and 1.B.2.b.5 gas distribution. During the review, the Party confirmed that CO_2 emissions were not estimated and stated that estimates will be provided in the next submission. The issue of CO_2 emissions from oil and gas operations is discussed in ID# E.43 in table 5.
E.23	1. General (energy sector) – all fuels – all gases	Include the relevant information on changes made to address recommendations	Addressing. The Party included information in the NIR (p.38) on recalculations made in the category 1.B.2 to address recommendations made in the

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	(E.31, 2016) (E.31, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	made in previous review reports, as requested in paragraph 50(i) of the UNFCCC Annex I inventory reporting guidelines.	previous review report. Responding to the question on recalculations made in the 2017 submission in response to a recommendation from the 2016 ARR, Belarus informed the ERT that, in addition to category 1.B.2, recalculations were also performed for the reference approach (see ID# E.8 above). However, this information is not reported in the NIR. In addition, some recalculations made in response to the recommendation from the 2016 ARR (see ID# E.25 below) were noted by the ERT during the review, but the associated information was not reported in the NIR.
E.24	Fuel combustion – reference approach – all fuels – CO_2 (E.32, 2016) (E.32, 2015) Comparability	Report the correct units of mass for all fuels in CRF table 1.A(b) and implement QC procedures.	Not resolved. Although CRF table 1.A(b) reports that the data are reported in the unit "TJ", the Party continues to report the actual AD in units of mass (kt).
E.25	Fuel combustion – reference approach – lignite – CO_2 (E.33, 2016) (E.33, 2015) Completeness	Strengthen the QC procedures and report the correct total amount of CO_2 emissions from the reference approach by including values for actual CO_2 emissions from all relevant fuels and the corresponding fraction of carbon oxidized.	Addressing. Belarus corrected the reporting of CO_2 emissions using the reference approach for lignite. However, the ERT noted that the correction of the amount of CO_2 emissions for coke oven/gas coke was not implemented (see also ID# E.32 below).
E.26	1.A.3.b Road transportation – all fuels – CO_2 (E.34, 2016) (E.34, 2015) Comparability	Make the necessary efforts to provide disaggregate estimates by subcategory under the road transportation category. If this is not possible, use the correct notation keys for all subcategories under road transportation, with the aim of ensuring the transparency of the information given in the CRF tables.	Addressing. The Party corrected the notation keys for all subcategories under road transportation and reported the AD and emissions under all road transportation subcategories (cars, light-duty trucks, heavy-duty trucks, buses and motorcycles) as "IE". The ERT noted that explanations for the use of the notation key "IE" were not provided in CRF table 9 (see ID# E.36 in table 5).
E.27	1.A.3 Transport – biomass – all gases (E.35, 2016) (E.35, 2015) Accuracy	Reallocate CH_4 and N_2O emissions from biomass in road transportation and railways to the category 1.A.4.a commercial/institutional; applying the correct CH_4 and N_2O EFs for wood/wood waste in the calculations; and estimate and report CO_2 emissions from biomass use in the corresponding categories, as well as use the correct notation key for CH_4 and N_2O emissions from biomass in road transportation and railways, if this type of fuel is not used in these categories.	Not resolved. The ERT noted that the Party did not reallocate emissions from biomass consumed in transportation and communication as fuel for stationary combustion in institutional buildings to the category 1.A.4.a commercial/institutional. The ERT noted that CH_4 and N_2O IEFs for biomass in road transportation are still both equal to 30 kg/TJ, while for railways the IEFs are 30.00 kg/TJ and 4.00 kg/TJ, respectively. The NIR does not provide any information on the type of biomass fuel used, as well as evidence for the choice of the EFs. The ERT also noted that in cases where biofuel is used for transport, the IPCC default EFs should be applied, but in cases where biomass is combusted by the stationary sources, these emissions should be reallocated to the category 1.A.4.a commercial/institutional and appropriate EFs should be applied depending on the biomass type.

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E.28	1.A.4.c Agriculture/ forestry/fishing – all fuels – all gases (E.36, 2016) (E.36, 2015) Transparency	Collect relevant AD to ensure the transparency and comparability of the reporting for this category, and ensure the consistency of the information provided in the NIR and CRF tables by using the correct notation keys, when it is not possible to disaggregate the emissions.	Not resolved. The ERT noted that in CRF table 1.A(a)s4, the notation key "NO" is still used for reporting emissions from the subcategory 1.A.4.c.ii off-road vehicles and other machinery for the entire time series, except for 2015. For 2015, neither a notation key nor AD were reported for this category (see ID#s G.25 above and E.36 in table 5).
E.29	1.B.2 Oil and natural gas and other emissions from energy production– liquid and gaseous fuels – all gases (E.37, 2016) (E.37, 2015) Accuracy	Include emission estimates for CO_2 and CH_4 from natural gas distribution, and emission estimates of all gases from all subcategories under venting and flaring, as well as for all subcategories under fugitive emissions from oil and natural gas, using methods and EFs in accordance with the 2006 IPCC Guidelines, and provide in the NIR detailed and documented information on AD and EFs used in the estimates.	Addressing. The ERT's assessment of the completeness of reporting for these categories is addressed elsewhere (see ID#s G.3, E.19 and E.22 above) and the ERT focuses here on the recommendation to use methods and EFs in accordance with the 2006 IPCC Guidelines. The ERT noted that the IEFs reported in CRF table 1.B.2 and the equation for the estimation of CH_4 emissions from the subcategories under venting and flaring and the subcategories under fugitive emissions from oil and natural gas provided in the NIR (p.37) are still the same as those reported in previous submissions, which is not in line with the 2006 IPCC Guidelines.
E.30	1.B.2 Oil and natural gas and other emissions from energy production– liquid and gaseous fuels – all gases (E.38, 2016) (E.38, 2015) Transparency	Provide in the NIR detailed and documented information on methods, AD and EFs used in the estimates, in particular when changes in methodologies, sources of information and assumptions are made in relation to recalculations, as well as information on the rationale for these recalculations and their impact on total emissions.	Not resolved. The information on methods, AD and EFs used in the estimates, in particular related to recalculations in category 1.B.2, is not presented in the NIR.
E.31	1.B.2 Oil and natural gas and other emissions from energy production– liquid and gaseous fuels – CO_2 and CH_4 (E.39, 2016) (E.39, 2015) Completeness	Estimate emissions from natural gas exploration activities, which may occur in the country, by collecting relevant missing AD in order to provide emission estimates of CH_4, CO_2 and N_2O from oil and natural gas exploration.	Not resolved. No estimates of emissions from natural gas exploration activities were reported in the NIR.
E.32	Fuel combustion – reference approach – all fuels – CO_2 (E.40, 2016) (E.40, 2015) Transparency	Treat refinery gas as secondary fuel, account for exports of jet kerosene and bitumen, estimate carbon stored, provide emission estimates from imports of lignite and coke, and include detailed information on the improvements made in the	Addressing. In the 2017 submission, refinery gas was treated as secondary liquid fuel (see ID# E.8 above) and data on imports of lignite and coke were included in the reference approach calculations. In addition, carbon excluded from the reference approach was reported both in CRF tables 1.A(b) and 1.A(d). The ERT noted that data on jet kerosene exports are still not included in the reference approach calculations, although data on jet kerosene exports exist in the

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		NIR of the next GHG inventory submission, and enhance the verification procedures to ensure the consistency of the information provided in CRF tables 1.A(b), 1.A(c) and 1.A(d).	national fuel and oil balance provided by the Party to the ERT during the review (see ID# E.41 in table 5).
E.33	Comparison with international data – liquid fuels, gaseous fuels, peat – all gases (E.41, 2016) (E.41, 2015) Transparency	Provide documented information on the country-specific NCVs used in the emission calculations, with the aim of demonstrating the accuracy of those values.	Not resolved. No additional explanations on the country-specific NCVs used in the emission calculations are presented in the 2017 NIR. The country-specific NCVs were provided to the ERT for the selected fuels only after a request made by the ERT during the review week.
IPPU			
I.1	2. General (IPPU) – all gases (I.1, 2016) (I.1, 2015) (50, 2013) (59 and 60, 2012) Completeness	Ensure that improvements in the transparency and completeness of the inventory are delivered.	Resolved. Improvements have been made in the 2017 inventory report regarding transparency and completeness, for example by providing more detailed category descriptions (e.g. for categories 2.A and 2.B) (see ID# I.2 below). Regarding completeness, the completeness of the CO_2 emissions for the category other uses of carbonates has been improved (see ID# G.3 above).
I.2	2. General (IPPU) – all gases (I.2, 2016) (I.2, 2015) (51, 2013) (59, 2012) Transparency	Follow the structure of the NIR outlined in the UNFCCC reporting guidelines to improve the transparency of the inventory for the industrial processes sector, and include clear and concise information in the NIR on the methods, AD and EFs used to estimate emissions for each subcategory.	Resolved. Improvements have been made, for example by providing more detailed category descriptions and descriptions of the processes and AD (e.g. for lime and ammonia production).
I.3	2.A.1 Cement production – CO_2 (I.4, 2016) (I.4, 2015) (53, 2013) (62, 2012) Accuracy	Use a higher-tier approach and strengthen efforts to collect plant-specific AD and EFs and use those data to calculate CO_2 emissions from cement production.	Not resolved. Although this is a key category, tier 1 default EFs from the 2006 IPCC Guidelines are still being used by the Party.
I.4	2.F. Product uses as substitutes for ozone-depleting substances – HFCs, PFCs and SF_6 (I.6, 2016) (I.6, 2015) (55, 2013) (60, 2012) Completeness	Obtain AD and report emission estimates for all gases.	Not resolved. The Party has not reported any emission estimates for category 2.F product uses as substitutes for ozone-depleting substances in the NIR and the CRF tables.
I.5	2.A.2 Lime production – CO_2	Use the correct CO_2 EF for dolomitic lime from table 2.4 of the 2006 IPCC Guidelines	Resolved. In the 2017 NIR, the correct tier 1 EFs from the 2006 IPCC Guidelines of 0.75 t/t for high calcium lime and 0.77 t/t for dolomitic lime have

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	(I.7, 2016) (I.7, 2015) Accuracy	or develop the national EFs and revise the estimates of CO_2 emissions from this category accordingly for the whole time series.	been applied.
I.6	2.A.3 Glass production – CO_2 (I.8, 2016) (I.8, 2015) Transparency	Clarify the values of cullet ratio used for the estimates of CO_2 emissions from glass production, include these data in the NIR and report revised estimates, if necessary.	Resolved. The NIR contains default cullet ratios from the 2006 IPCC Guidelines for flat glass and container glass which were applied in the calculation of the CO_2 emission estimates. The NIR (p.48) states that the Party plans to collect data on country-specific annual cullet ratios directly from the glass producers.
I.7	2.A.4 Other process uses of carbonates – CO_2 (I.9, 2016) (I.9, 2015) Accuracy	Clarify the activities where soda ash is used and subtract the amount accounted for in other categories (e.g. glass production) from the total soda ash consumed in the country to estimate CO_2 emissions in this category, avoiding any double counting. The ERT also recommends that Belarus describe the activities and sources of emissions from other uses of soda ash, trends and choice of AD in the NIR.	Not resolved. CRF table 2(I).A-Hs1 reports 7.42 kt CO_2 from other uses of soda ash in 2015. However, in the NIR, only soda ash use in glass manufacturing has been identified separately and has been included in the emissions from category 2.A.3 glass production. As the NIR does not contain sufficient information on this category, the accuracy of the emission estimates cannot be assessed.
I.8	2.B.1 Ammonia production – CO_2 (I.10, 2016) (I.10, 2015) Accuracy	Reconfirm the AD with the ammonia producer, including the amounts of CO_2 recovery for urea production, revise the estimates of CO_2 emissions from ammonia production on this basis for the whole time series, using the tier 2 or tier 3 method, and provide in the NIR a description of production process, EFs and AD used.	Not resolved. The NIR still does not include estimates of CO_2 recovery for urea production or a clear description of production process, or information on EFs and AD used for the tier 2 approach.
I.9	2.B Chemical industry – CO_2, CH_4 and N_2O (I.11, 2016) (I.11, 2015) Transparency	Ensure that the information in the NIR on emission estimates for this category is fully transparent in accordance with the requirements of the UNFCCC Annex I inventory reporting guidelines and include information on EFs used, references and descriptions of the production processes for the reported subcategories under the category chemical industry.	Addressing. The 2017 NIR contains more information and the Party has improved the transparency of the information, for example by reporting separately on the subcategories under category 2.B chemical industry, including information on the actual processes present in Belarus. However, the ERT noted that information on methodologies, AD and EFs provided in the NIR is still not fully transparent. The Party explained during the review that further improvements will be performed for its future submissions.
I.10	2.C Metal industry – CO_2 and CH_4 (I.12, 2016) (I.12, 2015) Transparency	Improve the transparency of the reporting on emission estimates from this category, ensure that the reporting is in full adherence with the UNFCCC Annex I inventory	Addressing. The 2017 NIR contains more information and the Party has improved the transparency of the information by reporting separately on the subcategories under category 2.C metal industry, including information on the AD and actual processes present in Belarus. However, the

ID[a]	Issue classification[a]	Recommendation made in previous review report	ERT assessment and rationale
		reporting guidelines and include in the NIR and the relevant CRF tables the information provided during the review on the processes for steel production in the country, AD and EFs used.	ERT noted that information on methodologies, AD and EFs provided in the NIR is still not fully transparent. The Party explained during the review that further improvements will be performed for its future submissions.
I.11	2.D Non-energy products from fuels and solvents use – CO_2, CH_4 and N_2O (I.13, 2016) (I.13, 2015) Completeness	Collect relevant available AD and estimate emissions for all subcategories under the category 2.D non-energy products from fuels and solvents use for the complete time series, for which the 2006 IPCC Guidelines provide estimation methods.	Not resolved. The NIR does not include GHG emission estimates for this category.
Agriculture			
A.1	3. General (agriculture) – all gases (A.1, 2016) (A.1, 2015) (57, 2013) (67, 2012) Transparency	Continue to take steps to improve the transparency of the inventory for the agriculture sector.	Addressing. The ERT considers that although the Party has made improvements in the transparency of the reporting for this sector (see ID# A.8 below), none of the outstanding transparency-related issues from the review of the 2012 inventory submission (the year this issue first appeared) were resolved in the 2017 inventory submission.
A.2	3. General (agriculture) – all gases (A.2, 2016) (A.2, 2015) (57, 2013) (68, 2012) Transparency	Provide reference sources for the parameters/factors for which such references are still lacking (e.g. CH_4 conversion rate for cattle livestock, coefficient corresponding to animal feeding situation (Ca) for cattle, weight of swine livestock).	Addressing. The Party has provided some references for parameters/factors in the NIR (pp.87, 88, 91 and 92). However, the ERT considers that the sources are not yet fully referenced in all NIR tables.
A.3	3. General (agriculture) – all gases (A.3, 2016) (A.3, 2015) (58, 2013) (71, 2012) Adherence to the UNFCCC Annex I inventory reporting guidelines	Follow the procedure described in the IPCC good practice guidance and perform the uncertainty analysis with uncertainty values related to each parameter/factor used in the emission estimation.	Not resolved. The Party did not provide the uncertainty analysis in accordance with the approach described in IPCC good practice guidance. It has provided uncertainty values for all sources in sections 5.2.3, 5.3.3 and 5.4.3 of the NIR, but the ERT finds that the references to values provided are not adequately described (see IDs# A.34 below and A.38 in table 5).
A.4	3.A.4 Other livestock – CH_4 (A.4, 2016) (A.4, 2015) (60, 2013) Transparency	Provide in the NIR references for the method employed and the CH_4 EFs and animal weights used to improve transparency.	Addressing. The Party included some detail on the methodology used to estimate emissions from other livestock (rabbits and fur animals) in the NIR (p.93). The ERT noted that the information provided lacks transparency as recommended in the 2006 IPCC Guidelines.
A.5	3.A Enteric fermentation –	Correct the notation key used.	Resolved. The Party has reported the notation key "NA" for average gross energy intake and average

ID[a]	Issue classification[b]	Recommendation made in previous review report	ERT assessment and rationale
	CH_4 (A.5, 2016) (A.5, 2015) (61, 2013) (74, 2012) Transparency		CH_4 conversion rate for sheep, goats, horses and swine in the 2017 inventory submission.
A.6	3.B Manure management – CH_4 (A.6, 2016) (A.6, 2015) (62, 2013) Transparency	Correct the mistakes in the additional information table of CRF table 4.B(a) and implement appropriate QC procedures to avoid such mistakes in the future.	Resolved. CRF table 3.B(a)s2 contains percentages for the allocation of manure between different MMS. The ERT noted that the allocation of manure to different management systems as reported in NIR table 5.15 is not consistent with the values in CRF table 3.B(a)s2.
A.7	3.D.a.4 Crop residues – N_2O (A.8, 2016) (A.8 2015) (65, 2013) (81, 2012) Accuracy	Make efforts to adjust the data collected from national statistics and calculate N_2O emissions from forage crops.	Resolved. The Party has provided data on crops in NIR table 5.23 and in annex A.5, as well as N_2O emission estimates for forage crops.
A.8	3. General (agriculture) – CO_2, CH_4 and N_2O (A.9, 2016) (A.9, 2015) Transparency	Provide in the NIR clear references to the sources of default EFs in the 2006 IPCC Guidelines (e.g. tables, pages) for all animal species other than cattle and include tables with country-specific EFs for non-dairy cattle and swine disaggregated by sex/age groups, for both enteric fermentation and manure management.	Resolved. The Party provided references to the sources of data in the NIR (tables 5.9 and 5.12). The ERT noted, however, that the disaggregation of non-dairy cattle is not consistent throughout the tables in the NIR (tables 5.14, 5.15 and 5.16).
A.9	3. General (agriculture) – CH_4 and N_2O (A.10, 2016) (A.10, 2015) Completeness	Report CH_4 and N_2O emissions from asses under enteric fermentation and manure management or, if not estimated, use the notation key "NE", providing justification for why such emissions from this animal category have not been estimated in the NIR and in CRF table 9, in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	Not resolved. The Party has not provided emission estimates or used the notation key "NE" for asses for both CH_4 and N_2O emissions.
A.10	3. General (agriculture) – CH_4 and N_2O (A.11, 2016) (A.11, 2015) Accuracy	Estimate the average annual population of growing animals that are alive for less than a year using national data on their lifecycle and equation 10.1 from the 2006 IPCC Guidelines.	Addressing. The Party has provided country-specific information on the livestock category "birds" in section 5.3.2 of the NIR. The ERT noted that the methodology used is not transparently described in the NIR (section 5.3.2) and the livestock population was not reported in CRF tables 3.As1 and 3.B(a)s2 even though it was reported in the NIR (table 5.6).
A.11	3. General (agriculture) –	Report typical animal mass values for horses, sheep and	Addressing. The Party has reported typical animal mass values for goats and horses in CRF table

ID#	Issue classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	N_2O (A.12, 2016) (A.12, 2015) Comparability	goats in CRF table 3.B(a) using the values provided in the NIR instead of using the notation key "NE".	3.B(a)s1 consistently with NIR table 5.17, but not for sheep. The ERT also noted that instead of using the notation key "NE", the Party used the notation key "NA" for sheep in CRF table 3.B(a)s1, which is not in line with the value reported in the NIR (table 5.17). Furthermore, the category sheep has been allocated to "other" in the CRF tables, which is not in line with the 2006 IPCC Guidelines (see ID# A.28 in table 5).
A.12	3.A.1 Cattle – CH_4 (A.13, 2016) (A.13, 2015) Consistency	Ensure consistency in the information provided regarding milk production and report the correct data on milk production for the reporting period in the NIR.	Resolved. The Party provided milk production data in the NIR (table 5.8) consistent with CRF table 3.As2.
A.13	3.A.1 Cattle – CH_4 (A.14, 2016) (A.14, 2015) Transparency	Include in the NIR a comparison analysis of the country-specific EFs and underlying parameters (milk production, weight, etc.) for dairy cattle with IPCC default values and EFs from countries with similar conditions, preferably in tabular format with explanations of substantial discrepancies identified.	Addressing. The Party has included a comparison of the CH_4 EFs with those of other countries in table 5.10 of the NIR. However, the ERT finds that this is not adequate to fully address the issue since the analysis covered only one parameter (the EFs).
A.14	3.A.4 Other livestock – CH_4 (A.15, 2016) (A.15, 2015) Accuracy	Report CH_4 emissions from enteric fermentation of fur-bearing animals and rabbits without rounding in CRF table 3.A.	Resolved. The Party has provided emission data for the relevant livestock categories in CRF table 3.A and NIR table 5.3 without rounding.
A.15	3.B.4 Other livestock – CH_4 (A.16, 2016) (A.16, 2015) Accuracy	Estimate emissions from poultry per subcategory based on statistical data of the country's population structure of poultry. Alternatively, if population structure is not available, data from the Food and Agriculture Organization of the United Nations can be used as a source of information on the populations of ducks and turkeys in Belarus.	Not resolved. The ERT noted that Belarus did not provide emission estimates from poultry per subcategory or AD on the poultry population structure in the NIR and the CRF tables.
A.16	3.B Manure management – CH_4 and N_2O (A.17, 2016) (A.17, 2015) Accuracy	Make efforts to collect data about the allocation fractions of non-dairy cattle and swine manure per liquid systems with and without natural crust cover and revise the estimations of CH_4 and N_2O for this category. The ERT noted that a well-documented expert judgment or survey	Not resolved. The Party explained that, according to its knowledge, the source of AD is unknown and informed the ERT that it will consult with experts for the following submission to calculate estimates for this category.

ID[a]	Issue classification[b]	Recommendation made in previous review report	ERT assessment and rationale
		results may be used as a data sources for manure allocation per liquid system.	
A.17	3.B.1 Cattle – N_2O (A.18, 2016) Adherence to the UNFCCC Annex I inventory reporting guidelines	Report the correct Nex values for dairy and non-dairy cattle in CRF table 3.B(b) and enhance the QC procedures to ensure the accuracy and consistency of the information reported in the CRF tables and the NIR.	Not resolved. The ERT noted that the reported Nex values for non-dairy cattle reported in the NIR (table 5.16) and in the CRF tables do not correspond to the means of the values provided for the subcategories in table 5.16 (similarly for swine). The QC procedures have not been improved sufficiently to ensure accuracy and consistency between the CRF tables and the NIR.
A.18	3.B Manure management – N_2O (A.19, 2016) (A.18, 2015) Accuracy	Report in CRF table 3.B(b) Nex values for all animal species without rounding.	Not resolved. The ERT noted that all Nex values in CRF table 3.B(b) are still rounded.
A.19	3.B.4 Other livestock – N_2O (A.20, 2016) (A.19, 2015) Accuracy	Use the correct Nex values for fur-bearing animals and rabbits from the 2006 IPCC Guidelines (table 10.19).	Resolved. The Party has provided the correct Nex values in NIR table 5.17 and in CRF table 3.B(b).
A.20	3.B.4 Other livestock – N_2O (A.21, 2016) (A.20, 2015) Accuracy	Derive typical poultry mass and Nex values per subcategory, using the poultry disaggregation per subcategory recommended in table 10.1 of the 2006 IPCC Guidelines (ducks, turkeys, etc.) and report in CRF table 3.B(b) average typical poultry mass value instead of the notation key "NE".	Not resolved. The ERT noted that poultry categories have not been disaggregated and Nex estimates have not been reported for the subcategories.
A.21	3.B.5 Indirect N_2O emissions – N_2O (A.22, 2016) (A.21, 2015) Accuracy	Report N_2O indirect emissions from atmospheric deposition in CRF table 3.B(b) without rounding.	Resolved. The Party has reported indirect emissions from atmospheric deposition without rounding. The ERT noted, however, that a fraction of volatile N is allocated to non-dairy cattle (NIR table 5.18), which is inconsistent with table 10.22 of the 2006 IPCC Guidelines. Similarly, an estimate of the N excreted to liquid systems from non-dairy cattle is allocated to CRF table 3.B(b), which is not consistent with the 2006 IPCC Guidelines (see ID# A.34 in table 5).
A.22	3.D.a.5 Mineralization/immobilization associated with loss/gain of soil organic matter – N_2O (A.24, 2016) (A.23, 2015) Completeness	Estimate N_2O emissions from N in mineral soils that are mineralized in association with loss of soil carbon, based on the recommendations of the 2006 IPCC Guidelines (vol. 4, chapter 2, equation 2.25).	Resolved. The Party has reported the time series of AD and emissions of N_2O from mineralization in CRF table 3.D and in the NIR (section 5.4.2.1) in line with the 2006 IPCC Guidelines.
A.23	3.D.b Indirect – N_2O emissions from managed soils	Report indirect emissions from cropland and grassland in the agriculture sector using CRF	Resolved. The Party has reported indirect emissions from managed soils in CRF table 3.D. A general description of the calculations is also provided in the

ID#	*Issue classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
	N_2O (A.25, 2016) (A.24, 2015) Comparability	table 3.D, in accordance with the UNFCCC Annex I inventory reporting guidelines.	NIR (section 5.4.2), which the ERT finds is not sufficiently transparent (see ID# A.37 in table 5).
A.24	3.D.b.1 Atmospheric deposition – N_2O (A.26, 2016) (A.25, 2015) Comparability	Report the value of $Frac_{GASM}$ in the additional information table of CRF table 3.D instead of using the notation key "NO" and provide references to this fraction in the NIR.	Resolved. The Party has included a value for the $Frac_{GASM}$ parameter (of 0.2) in CRF table 3.D for the entire time series, which falls within the uncertainty range provide in table 11.3 of the 2006 IPCC Guidelines. However, the ERT finds that Belarus did not provide the rationale for selecting this $Frac_{GASM}$ value (see ID# A.34 in table 5).
A.25	3.H Urea application – CO_2 (A.27, 2016) (A.26, 2015) Completeness	Make efforts to collect specific data on urea application in the country for the complete time series or, alternatively, derive data based on production and import/export or international databases, including using interpolation/extrapolation methods for any data gaps, as recommended by the 2006 IPCC Guidelines, and report emissions from urea application.	Resolved. The Party has reported the time series of AD and emissions of CO_2 from urea application on soils in CRF table 3.G-I and in the NIR (section 5.6) in line with the 2006 IPCC Guidelines.
LULUCF			
L.1	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.1, 2016) (L.1, 2015) (67, 2013) (83, 2012) Completeness	Provide in the NIR and the CRF tables estimates of carbon stock changes and emissions for all mandatory categories, provide a consistent uncertainty analysis for each estimated category, enhance the QA/QC procedures that are used for the LULUCF sector and, as a minimum, undertake an internal technical review to ensure consistency between the NIR and the CRF tables.	Addressing. Belarus estimates carbon stock change for deadwood, litter and minerals soils on forest land remaining forest land in the 2017 inventory submission for the first time. The Party explained that it intends to estimate all missing categories using at least a tier 1 approach, provide an uncertainty analysis and enhance QA/QC procedures for each estimated category. An internal technical review will be undertaken to ensure consistency between the NIR and the CRF tables.
L.2	Land representation – CO_2 (L.2, 2016) (L.2, 2015) (68, 2013) (84, 2012) Accuracy	Include in the NIR complete, reconciled and transparent information on the areas of land corresponding to the IPCC land-use categories and the identified land-use transitions, including a transparent description of the sources of data and associated methodologies and information on how the national land-use categorization is linked to the IPCC land-use categories.	Resolved. Belarus included in the 2017 submission (NIR table 6.2) the required information and provided additional information in section 6.1.2 of the NIR which shows the relationship between the country-specific land-use categories and the IPCC land-use categories.
L.3	4.A.1 Forest land remaining forest land – CO_2	Develop the necessary national AD to quantify the potential emissions and removals for the	Resolved. Belarus calculated emissions and removals for the dead organic matter carbon pool in the forest land remaining forest land subcategory using a tier 2

ID[a]	Issue classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	(L.3, 2016) (L.3, 2014 (69, 2013) (86, 2012) Completeness	dead organic matter carbon pool using a tier 2 or higher method.	method (see NIR section 6.2.2.4). The ERT commends the Party for this improvement.
L.4	4.A.1 Forest land remaining forest land – CO_2 (L.4, 2016) (L.4, 2015) (70, 2013) Transparency	Increase the transparency of the NIR by including information on the specific definition of growing stock as applied by Belarus and information on the forest types in terms of their age span.	Not resolved. No additional information was provided in the NIR on the definition of growing stock or the age span of forest types.
L.5	4.A.1 Forest land remaining forest land – CO_2 (L.5, 2016) (L.5, 2015) (71, 2013) Completeness	Put in place QC procedures to ensure the consistency and completeness of the reporting on organic soils under forest land as well as the consistency between the CRF tables.	Resolved. The Party reported "NE" for the areas of organic soils on forest land remaining forest land in CRF tables 4.A and 4(II). The QC procedures put in place by the Party are detailed in section 6.2.4 of the NIR.
L.6	4.A.2 Land converted to forest land – CO_2 and N_2O (L.6, 2016) (L.6, 2015) (72, 2013) (89, 2012) Completeness	Improve the completeness and transparency of the reporting on organic soils and land converted to forest land in the CRF tables and the NIR, and ensure consistency of the information reported in the NIR with that reported in the CRF tables.	Addressing. Belarus reported the area of organic soils on land converted to forest land in the 2017 submission (178.72 kha in 2015) (the area was reported as "NE, NO" in the 2016 submission). However, it did not separately calculate the content of carbon in organic soils. According to the Party, these data are included in the category forest land remaining forest land. During the review, Belarus also explained that, in future submissions, it plans to reassess the areas and divide the emissions into two categories: forest land remaining forest land; and land converted to forest land.
L.7	4.A.1 Forest land remaining forest land – CO_2 (L.7, 2016) (L.7, 2015) Transparency	Provide documented justification on the value of the country-specific carbon fraction in dry matter used in the estimates of carbon stock changes in living biomass, and if this is not possible, revise the estimates of carbon stock changes in living biomass based on the appropriate default value provided in the 2006 IPCC Guidelines and include in the NIR the necessary AD (e.g. harvesting and forest fires) and information on the EFs and coefficients used in the estimates to ensure transparency and full implementation of the 2006 IPCC Guidelines.	Resolved. Belarus revised its estimate of carbon stock changes in living biomass based on the default values provided in the 2006 IPCC Guidelines. Belarus also included in the NIR the AD and information on the EFs and coefficients used in the estimates (section 6.2.2.1).
L.8	4(V) Biomass burning – CO_2, CH_4 and N_2O (L.8, 2016)	Revise the emission estimates from biomass burning on forest land in accordance with the 2006 IPCC Guidelines and	Resolved. This category was recalculated for the entire time series using EFs from the 2006 IPCC Guidelines (section 6.2.2.2 of the NIR). The ERT commends Belarus for this improvement in accuracy

ID[a]	Issue classification[b]	Recommendation made in previous review report	ERT assessment and rationale
	(L.8, 2015) Accuracy	provide in the NIR all AD and national and default parameters used for the estimates.	and consistency with the 2006 IPCC Guidelines.
Waste			
W.1	5.C.1 Waste incineration – CO_2, CH_4 and N_2O (W.1, 2016) (W.1, 2015) (75, 2013) (93, 2012) Completeness	Improve the consistency of the reporting and provide more information in the NIR on the thermal treatment of industrial waste, and estimate any resulting emissions from the thermal treatment of waste and report such emissions in the NIR and the CRF tables.	Addressing. Belarus provided in the NIR (p.196) information on the amount and types of waste treated thermally in 2015 and a table with information on operational facilities. The resulting emissions from the thermal treatment of waste were not estimated in the CRF tables ("NO" is reported in CRF table 5.C).
W.2	5.A Solid waste disposal on land – CH_4 (W.2, 2016) (W.2, 2015) (76, 2013) (94, 2012) Accuracy	Use the IPCC first-order decay method to estimate CH_4 emissions from solid waste disposal on land.	Not resolved. The Party did not use the first-order decay method to estimate CH_4 emissions from solid waste disposal on land in accordance with the 2006 IPCC Guidelines. During the review, Belarus confirmed that it used equation 5.2 from the 2006 IPCC Guidelines (volume 1) to estimate CH_4 emissions for the years prior to 1994 and the default method from the Revised 1996 IPCC Guidelines to estimate CH_4 emissions for the years after 1994.
W.3	5.A Solid waste disposal on land – CH_4 (W.3, 2016) (W.3, 2015) (77, 2013) (95, 2012) Transparency	Provide a more comprehensive explanation of the classification of SWDS in the NIR to improve transparency.	Resolved. Belarus presented an explanation of the classification of SWDS in NIR table 7.2 ("Comparison of the requirements of the regulatory documents of the Republic of Belarus and the 2006 IPCC Guidelines") for managed solid waste landfills.
W.4	5.A Solid waste disposal on land – CH_4 (W.5, 2016) (W.5, 2015) (79, 2013) (96, 2012) Completeness	Estimate CH_4 emissions from wastewater sludge and provide more detailed information in the NIR on the amount of MSW, industrial solid waste and wastewater sludge that is landfilled.	Not resolved. During the review, Belarus explained that there is no generalized information in the country and that it will prepare a request for collecting the relevant information from each SWDS.
W.5	5.D Wastewater treatment and discharge – CH_4 (W.7, 2016) (W.7. 2015) (81, 2013) (99, 2012) Transparency	Provide more information on wastewater treatment systems and discharge pathways in the NIR to justify that there are no emissions and use the notation key "NO" instead of "NE".	Not resolved. During the review, Belarus explained that it will request the relevant information from the wastewater treatment facilities, process the information and change the notation keys accordingly.
W.6	5.A Solid waste disposal on land – CH_4 (W.8, 2016) (W.8, 2015) Transparency	Identify the country-specific management practices of CH_4 recovery or flaring and report accordingly in the next GHG inventory submission the respective amounts of CH_4	Not resolved. Additional information was not provided in the NIR and the Party continues to report "NE" without explaining the use of this notation key in the NIR or CRF table 9. During the review, Belarus explained that it will request information on management practices of CH_4 recovery or flaring and

ID[a]	Issue classification[a]	Recommendation made in previous review report	ERT assessment and rationale
		recovered for energy recovery purposes or flared; alternatively, use the notation key "NO", in the case of absence of such practices in the country or justify the use of the notation key "NE".	will revise the notation keys accordingly.
W.7	5.A Solid waste disposal on land – CH_4 (W.9, 2016) (W.9, 2015) Accuracy	Collect and elaborate updated information on MSW historical composition using all available reference sources from national studies, surveys and results of relevant projects.	Not resolved. In the NIR (table 7.3), the morphological composition of MSW was reported for the years 1999, 2004, 2007, 2008 and 2010. However, the ERT noted that the morphological composition of MSW is not reported in a consistent manner. For instance, for the years 1999 and 2008 a range of values are reported and not a single value as for the other years of the time series. Also, for the year 2007, glass and plastic are included in the category "other", while for the other years they are reported separately. For some years, bonds and leather waste are reported, while for other years they are not. The Party explained that the data were taken from several documents of the Ministry of Housing and Communal Services with different methodologies used for determining the morphological composition of MSW. For 2007, glass and plastic were included in the category "other" because until 2011 there were no strict rules for reporting on the morphological composition of waste.
W.8	5.A Solid waste disposal on land – CH_4 (W.9, 2016) (W.9, 2015) Accuracy	Explore the possibility of initiating sample measurement of MSW composition in specialized laboratories, ensuring a better reflection of the real historical composition of the MSW disposed in SWDS, including information on the disposal of sludge originated from wastewater treatment and industrial solid waste, enabling also the use of higher-tier methods for estimating CH_4 emissions from solid waste disposal following the guidance available in the 2006 IPCC Guidelines.	Not resolved. During the review, Belarus explained that it has not been able to initiate sample measurements of MSW composition in specialized laboratories, owing to the absence of sufficient financial support. Information on the disposal of sludge originating from wastewater treatment and industrial solid waste will be requested directly from the operators of SWDS.
W.9	5.A Solid waste disposal on land – CH_4 (W.10, 2016) (W.10, 2015) Accuracy	Improve the QC procedures, choose a correct oxidation factor default value and MCF from the 2006 IPCC Guidelines corresponding with the management practices applicable for the SWDS in Belarus and use these factors correctly for estimating and reporting CH_4 emissions in the NIR and CRF tables.	Not resolved. In CRF table 5.A. the Party continues to report all CH_4 emissions as being from unmanaged landfills. During the review, Belarus explained that all SWDS are divided into deep and shallow unmanaged sites in accordance with table 3.1 of the 2006 IPCC Guidelines. However, in the NIR (p.190) the Party explained that 96 of the 170 SWDS in Belarus can be considered as managed and therefore the ERT assessed that the values used for the oxidation factor and MCF parameters, characterizing the country-specific management practices of the SWDS have not been chosen correctly (see ID# W.12

ID[a]	*Issue classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
			in table 5).
W.10	5.D Wastewater treatment and discharge – CH_4 (W.11, 2016) (W.11, 2015) Transparency	Explore and document the existence of CH_4 for energy recovery and flaring at wastewater treatment plants and, depending on the results obtained, report accordingly in the NIR and CRF tables the CH_4 recovered and/or flared, or use the correct notation key for the domestic and industrial wastewater category.	Not resolved. Additional information on CH_4 recovery and/or flaring at wastewater treatment plants was not provided in the NIR. Although Belarus is reporting "NE" (which is consistent with the fact that the recovery and flaring of CH_4 is not estimated) the use of the notation key "NE" is not explained in the NIR or in CRF table 9. During the review, Belarus explained that it will request information on management practices and CH_4 recovery and/or flaring from the relevant authorities.
W.11	5.D Wastewater treatment and discharge – N_2O (W.12, 2016) (W.12, 2015) Accuracy	Investigate the wastewater treatment practices in the country and provide in the NIR a transparent description of the activities occurring under this category, together with estimates of direct and/or indirect N_2O emissions, in accordance with the methodological approaches available in the 2006 IPCC Guidelines, using the adjusted protein consumption data provided by Belstat during the review.	Not resolved. No further description of wastewater treatment practices was provided in the NIR and N_2O emissions were held constant between 2014 and 2015 (0.77 kt N_2O) and the time series not recalculated. During the review, Belarus explained that it will provide tabular data on the adjusted protein consumption data, which will be obtained from Belstat.

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue was raised. Issues are identified in accordance with paragraphs 80–83 of the UNFCCC review guidelines and classified as per paragraph 81 of the same guidelines. Belarus was not subject to an individual inventory review in 2014. Therefore, 2014 is excluded from this table.

IV. Issues identified in three successive reviews and not addressed by the Party

7. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues included in table 4 have been identified in three successive reviews, including the review of the 2017 inventory submission of Belarus, and have not been addressed by the Party.

Table 4
Issues identified in three successive reviews and not addressed by Belarus

ID[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed[a]*
General		
G.1	Submit inventories by 15 April each year as required by decision 18/CP.8	3 (2013–2017)
G.2	Provide the missing sections in the NIR following the structure outlined in the UNFCCC reporting guidelines	3 (2013–2017)
G.3	Collect AD and estimate emissions for all categories and subcategories which are currently reported as "NE", but for which the IPCC provides estimation methods	4 (2012–2017)

ID[a]	Previous recommendation for the issue identified	Number of successive reviews issue not addressed[b]
G.5	Put in place robust QA/QC procedures and report complete and detailed information on sectoral QA/QC procedures in the NIR, in particular for the key categories	4 (2012–2017)
G.6	Include in the NIR more information to explain the methodologies and procedures used in the calculations, a description of the data-collection process and more data tables to present the AD and EFs that have been used, as well as provide background information on all AD used in the inventory, specifically for the energy and industrial processes sectors	4 (2012–2017)
G.7	Include in the NIR information on the personnel involved in the development and management of the inventory in order to demonstrate sufficient levels of capacity and expertise to undertake the various tasks and roles within the inventory team	4 (2012–2017)
G.8	Enhance efforts to implement improvements to the inventory by using higher-tier estimation methods and country-specific EFs for key categories, in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF	4 (2012–2017)
G.10	Report complete and detailed information on sectoral QA/QC procedures in the NIR, in particular for the key categories, and use the information available on internal and external reviews to help develop the section of the NIR that describes the QA/QC procedures undertaken	4 (2012–2017)
G.11	Undertake a key category analysis following the IPCC good practice guidance	3 (2013–2017)
G.12	Report in the NIR whether the Party uses the key category analysis in the prioritization of developments in and improvements to its inventory	4 (2012–2017)
G.13	Include an explanation for the observed changes in the reported uncertainty estimates between inventory submissions in the NIR; use only well-documented country-specific values for parameters in the uncertainty analysis; and report how the uncertainty analysis is used to prioritize inventory improvements	4 (2012–2017)
Energy		
E.1	Improve transparency and include detailed information on EFs and AD in the NIR, for example by including summary tables of the AD and EFs used for the inventory estimations together with a clear description of the sources thereof, and by providing clear indications of the methodology used	4 (2012–2017)
E.2	Where possible, use country-specific EFs for key categories	4 (2012–2017)
E.4	Include in the NIR detailed information on data management and handling	4 (2012–2017)
E.5	Implement QC procedures to ensure the correct and consistent use of notation keys	3 (2013–2017)
E.6	Use appropriate CH_4 and N_2O EFs to estimate emissions from road transportation	3 (2013–2017)
E.7	Investigate and explain in the NIR and the CRF tables the reasons for the observed difference between the reference approach and the sectoral approach	4 (2012–2017)
E.9	Include in the NIR a comparison of the fuel data used in the inventory and the corresponding IEA data, clarifying the reasons for any significant differences	3 (2013–2017)
E.10	Provide information in the NIR on how jet kerosene is allocated between domestic and international flights for the period 2000–2011	4 (2012–2017)
E.12	Ensure consistency between CRF tables 1.A(b), 1.A(c) and 1.A(d)	3 (2013–2017)
E.13	Obtain information on the utilization of naphtha, lubricants, coal and coal	4 (2012–2017)

ID[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed[b]*
	products as feedstocks and for non-energy purposes; use this information to improve the accuracy of emission estimates; and provide detailed relevant explanations in the NIR to improve transparency	
E.14	Follow the IPCC good practice guidance for key categories under stationary combustion and use country-specific carbon contents for all fuels	4 (2012–2017)
E.15	Explain in more detail the derivation of the country-specific NCVs for solid fuels and provide a justification for their use	4 (2012–2017)
E.16	Report disaggregated emission data by subcategory under manufacturing industries and construction and reallocate the emissions from petroleum refining and manufacture of solid fuels and other energy industries to the energy industries category	4 (2012–2017)
E.17	Use country-specific EFs to estimate emissions for this key category	4 (2012–2017)
E.18	Include in the NIR data on the volume of gas transmission (including any transit amounts) to improve transparency	3 (2013–2017)
E.20	Develop QC procedures for the oil and natural gas category, in order to ensure the accuracy of estimates, time-series consistency, the correct use of the notation keys and the transparency of the information provided in the NIR	3 (2013–2017)
E.21	Use the correct value of CH_4 EF for liquefied petroleum gas and revise the N_2O emission estimates using appropriate N_2O EFs, considering also the possibility of estimating the amount of fuel used by vehicle type and the number of vehicles equipped with catalytic convertors	4 (2012–2017)
E.22	Collect data to allow the estimation and reporting of all associated emissions	3 (2013–2017)
IPPU		
I.3	Use a higher-tier approach and strengthen efforts to collect plant-specific AD and EFs and use those data to calculate CO_2 emissions from cement production	4 (2012–2017)
I.4	Obtain AD and report emission estimates for all gases	4 (2012–2017)
Agriculture		
A.1	Continue to take steps to improve the transparency of the inventory for the agriculture sector	4 (2012–2017)
A.2	Provide reference sources for the parameters/factors for which such references are still lacking (e.g. CH_4 conversion rate for cattle livestock, coefficient corresponding to animal feeding situation (Ca) for cattle, weight of swine livestock)	4 (2012–2017)
A.3	Follow the procedure described in the IPCC good practice guidance and perform the uncertainty analysis with uncertainty values related to each parameter/factor used in the emission estimation	4 (2012–2017)
A.4	Provide in the NIR references for the method employed and the CH_4 EFs and animal weights used to improve transparency	3 (2013–2017)
A.6	Correct the mistakes in the additional information table of CRF table 4.B(a) and implement appropriate QC procedures to avoid such mistakes in the future	3 (2013–2017)
LULUCF		
L.1	Provide in the NIR and the CRF tables estimates of carbon stock changes and emissions for all mandatory categories, provide a consistent uncertainty analysis for each estimated category, enhance the QA/QC procedures that are used for the LULUCF sector and, as a minimum, undertake an internal technical review to	4 (2012–2017)

ID[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed[b]*
	ensure consistency between the NIR and the CRF tables	
L.4	Increase the transparency of the NIR by including information on the specific definition of growing stock as applied by Belarus and information on the forest types in terms of their age span	3 (2013–2017)
L.6	Improve the completeness and transparency of the reporting on organic soils and land converted to forest land in the CRF tables and the NIR, and ensure consistency of the information reported in the NIR with that reported in the CRF tables	4 (2012–2017)
Waste		
W.1	Improve the consistency of the reporting and provide more information in the NIR on the thermal treatment of industrial waste, and estimate any resulting emissions from the thermal treatment of waste and report such emissions in the NIR and the CRF tables	4 (2012–2017)
W.2	Use the IPCC first-order decay method to estimate CH_4 emissions from solid waste disposal on land	4 (2012–2017)
W.4	Estimate CH_4 emissions from wastewater sludge and provide more detailed information in the NIR on the amount of MSW, industrial solid waste and wastewater sludge that is landfilled	4 (2012–2017)
W.5	Provide more information on wastewater treatment systems and discharge pathways in the NIR to justify that there are no emissions and use the notation key "NO" instead of "NE"	3 (2013–2017)

[a] The review of the 2016 GHG inventory submission was held in conjunction with the review of the 2015 GHG inventory submission. Since the reviews of the 2015 and 2016 GHG inventory submissions were not "successive" reviews, but were held in conjunction, for the purpose of counting successive years in table 4, 2015/2016 are considered as one year. In addition, Belarus was also not subject to an individual inventory review in 2014. Therefore, 2014 is excluded from this table.

V. Additional findings made during the 2017 individual inventory review

8. Table 5 contains findings made by the ERT during the individual review of the 2017 inventory submission of Belarus that are additional to those identified in table 3.

Table 5
Additional findings made during the 2017 individual review of the inventory submission of Belarus

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue?[a] If yes, classify by type*
General			
G.19	Inventory arrangements	During the review, the ERT found that the national inventory arrangements for the estimation of anthropogenic GHG emissions by sources and removals by sinks which are currently in place in Belarus may still be inappropriate to meet the enhanced requirements under the UNFCCC Annex I inventory reporting guidelines. The ERT concluded that substantial efforts are necessary to make the national inventory arrangements capable of functioning under the new framework of reporting requirements. Therefore, the ERT would like to reiterate the encouragement from the previous review report that Belarus consider making substantial efforts to make the national inventory arrangements capable of functioning and meeting the enhanced reporting requirements through the actions of the Ministry of Natural Resources and Environmental Protection, which has overall responsibility for the preparation, planning and management of the national inventory. These efforts could include updating the legal framework and improving the institutional cooperation on data and information supply, including the support provided by experts (e.g. from Belstat, the Ministry of Forestry, the Academy of Sciences of Belarus and research institutes on forestry and agriculture). Further, these efforts could also include providing more capacity-building activities and support to the Belarus Scientific and Research Centre "Ecology", which is responsible for the compilation and reporting of the GHG inventory (e.g. maintaining the current team and ensuring a sufficient number of competent national experts for each inventory sector and facilitating the participation of relevant institutions in the inventory process, as well as promoting continuous improvements via training and practical experience).	Not an issue
G.20	Inventory arrangements	The ERT noted that the NIR does not contain information on which entity is the single national entity with overall responsibility for the national GHG inventory and information on changes in the national inventory arrangements since the previous 2016 annual submission. During the review, the Party explained that according to the Order No. 417 of the Ministry of Natural Resources and Environmental Protection of 29 December 2005, the Belarus Scientific and Research Centre "Ecology" is the single national entity responsible for the preparation of the GHG inventories and national communications. The ERT recommends that Belarus align the reporting on the national inventory arrangements in accordance with the UNFCCC Annex I inventory reporting guidelines, paragraph 50(j), and provide a description of the legal, institutional and procedural arrangements for the preparation of the GHG inventory, together with clear information on the roles and responsibilities of all organizations contributing to the preparation of annual inventories, as well as on changes in the national institutional arrangements.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
G.21	NIR	The ERT noted that the following chapters and information are missing from the NIR, in addition to those indicated in ID# G.2 in table 3: changes in the national inventory arrangements since the previous annual GHG inventory submission (decision 24/CP.19, annex I, appendix, chapter 1.2.4); a general uncertainty evaluation, including data on the overall uncertainty of the inventory totals (decision 24/CP.19, annex I, appendix, chapter 1.6); subchapters on time-series consistency at the category level for the category feedstocks and non-energy use of fuels (decision 24/CP.19, annex I appendix, chapter 3.2.3); a chapter on recalculations and improvements (decision 24/CP.19, annex I, appendix, chapter 10); an annex on the assessment of uncertainty	Yes. Adherence to the UNFCCC Annex I inventory reporting

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? If yes, classify by type
		(decision 24/CP.19, annex I, appendix, annexes to the national inventory report, annex 2); an annex on detailed methodological descriptions for individual source or sink categories (decision 24/CP.19, annex I, appendix, annexes to the national inventory report, annex 3); and an annex containing the national energy balance for the most recent inventory year (decision 24/CP.19, annex I, appendix, annexes to the national inventory report, annex 4). The Party explained during the review that it will make efforts to follow the structure provided in the UNFCCC Annex I inventory reporting guidelines (decision 24/CP.19) when preparing future NIRs. The ERT recommends that Belarus provide the missing sections in the NIR following the structure outlined in the UNFCCC Annex I inventory reporting guidelines.	guidelines
G.22	Key category analysis	During the review, the ERT noted that tables 4.2 and 4.3 of the 2006 IPCC Guidelines on the key category analysis have not been reported in the NIR. The ERT encourages Belarus to provide in its NIR a key category assessment consistent with tables 4.2 and 4.3 of the 2006 IPCC Guidelines.	Not an issue
G.23	Uncertainty analysis	Belarus did not provide data on the estimation of the uncertainty of the total GHG emissions for 2015 in line with the 2006 IPCC Guidelines (volume 1, chapter 3) (see ID# G.13 in table 3).During the review, the Party stated that an uncertainty analysis was not performed for the 2017 inventory submission. The ERT recommends that Belarus perform and report on the uncertainty assessment by including information on the quantitative estimates of the uncertainty of the data used for all source and sink categories using the 2006 IPCC Guidelines, and report uncertainties for the base year and the latest inventory year as well as the methods and underlying assumptions used.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
G.24	QA/QC and verification	The information reported in the NIR does not provide clear details of: the QA arrangements of the Party and how these arrangements relate to the IPCC methods and good practices (2006 IPCC Guidelines, volume 1, chapters 6.5 and 6.8); whether there is a plan with specific QA objectives, activities, a time frame and defined institutional responsibilities; the role of QA arrangements in the inventory planning and improvement process; and whether an external review (QA) has been performed for the 2017 submission and by whom. Furthermore, a number of gaps and inconsistencies between the NIR and the CRF tables were identified by the ERT (see ID#s G.19, G.20, G.21 and G.23 above), which implies that the QA/QC procedures put in place are not able to fulfil the requirements under the UNFCCC Annex I inventory reporting guidelines. During the review, the Party stated that for the 2017 annual inventory submission it performed a peer review for the waste sector only, involving a specialist from the Department of Waste Management of the Belarus Scientific and Research Centre "Ecology", while the inventory as a whole was checked and approved for submission by the Ministry of Natural Resources and Environmental Protection. The ERT recommends that the Party include in the NIR detailed information on the QA/QC arrangements in place, in accordance with the UNFCCC Annex I inventory reporting guidelines, including information on the QA/QC plan and on QA/QC procedures already implemented or planned to be implemented in the future.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
G.25	Notation keys	The ERT noted that in the 2017 annual inventory submission the use of notation keys is not always consistent with decision 24/CP.19, annex I, paragraphs 37, 50(f) and 53; there are still many cells that are blank in all categories and there are cases of incorrect use of notation keys or lack of explanatory information in the NIR on the use of some notation keys, as described in the	Yes. Comparability

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue?[a] If yes, classify by type
		sector-specific findings below. Belarus uses the notation key "NA" for a number of categories in all sectors even though some of these activities do occur within the country and result in emissions (see ID# G.3 in table 3 and the sector-specific findings below). The corresponding emissions should therefore be estimated and reported or other notation keys, such as "NE", "IE" or "NO", should be used, as appropriate, to report these categories. In addition, Belarus did not provide in the NIR and in CRF table 9 detailed information or explanations on the assessment of completeness. The ERT recommends that the Party complete all cells in the CRF tables, ensuring that no cells are left blank, and ensure the correct use of the notation keys (including "NA") in the CRF tables in line with decision 24/CP.19, annex I, paragraphs 37, 50(f) and 53. The ERT further recommends that the Party provide justification for the use of notation keys, particularly the notation keys "NE" and "IE", in the NIR and in CRF table 9.	
Energy			
E.34	1. General (energy sector)	The ERT noted that no information is provided in the NIR on QA procedures in the energy sector, such as review procedures conducted by personnel not directly involved in the preparation of the inventory. During the review, the Party confirmed that it had not performed a review by external experts not directly involved in the preparation of the inventory specifically for the energy sector. However, the general QA procedures were performed by the Ministry of National Resources and Environmental Protection. The ERT encourages Belarus to perform QA procedures for the energy sector, such as review procedures conducted by personnel not directly involved in the preparation of the inventory for the next submission.	Not an issue
E.35	1. General (energy sector)	The ERT noted that Belarus did not include the fuel and energy balance in the 2017 NIR; however, it was included in the NIR of the previous submissions. During the review, the Party provided the national fuel and energy balance to the ERT. The ERT recommends that Belarus include in the NIR the fuel and energy balance for the most recent inventory years.	Yes. Transparency
E.36	1. General (energy sector) – all fuels – all gases	The ERT noted that for a number of categories, the cells for the AD and emissions have been left blank (i.e. no data or notation keys have been provided), for example for categories 1.A.2.f non-metallic minerals; 1.A.2.g other industries (peat); 1.A.5.b other (mobile); 1.B fugitive emissions, solid fuels; and 1.B.2.d fugitive emissions, oil and natural gas, other (CO_2 and N_2O emissions) (see also ID# G.25 above). The ERT also noted that there is still a lack of transparency regarding the reason for the changes of notation keys made by the Party for certain categories and a lack of clear information on which changes have been made to the notation keys. The Party confirmed that notation keys should be used for the above-mentioned categories and informed the ERT that it will do so in the next inventory submission. The ERT recommends that Belarus provide information in CRF table 9 explaining the reasons for the use of the notation keys "IE" and "NE", and information in the NIR on the changes to the notation keys made since the previous submission.	Yes. Transparency
E.37	1. General (energy sector) – solid fuels – CO_2	The ERT noted that the AD for lignite reported for the reference approach and most categories for the sectoral approach are the same as the national statistical data for bituminous coal (the sum of anthracite, coking coal and other bituminous coal) for the corresponding category. During the review, the Party informed the ERT that it does not have AD disaggregated by type of coal for the whole times series 1990–2015. Even though the national statistical data are disaggregated by coal type since 2011 when	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? If yes, classify by type
	CH_4 and N_2O	the statistics data-collection forms were changed, the Party continues to report consumption of all types of coal as lignite. The ERT noted that this is not in line with the 2006 IPCC Guidelines and could lead to an overestimation or underestimation of emissions because the EFs for different coal types differ. The ERT recommends that Belarus report the AD and emissions for different coal types separately according to the statistical data for the years after 2011 and apply the statistical tools provided in the 2006 IPCC Guidelines for the years 1990–2010 to resolve data gaps and ensure time-series consistency.	
E.38	1.A. Fuel combustion – sectoral approach – biomass – CO_2	The ERT noted that CO_2 emissions from biomass are reported as "NO, NA, IE" in CRF tables 1.A(a)s1 and 1.A(a)s2 and are not reported as memo items in CRF table 1s2. During the review the Party confirmed that CO_2 emissions from biomass were not estimated. The ERT recommends that Belarus calculate CO_2 emissions from biomass consumption for categories 1.A.1. and 1.A.2. and report them in the sectoral approach categories and memo items.	Yes. Completeness
E.39	1.A. Fuel combustion – sectoral approach – refinery gas – CO_2, CH_4 and N_2O	The ERT noted that in response to the recommendation in the 2016 ARR (see ID# E.8 in table 3), Belarus reported the refinery gas as a secondary liquid fuel in the reference approach calculations. However, it was not clearly specified in the NIR where the emissions from refinery gas are reported in the sectoral approach of the 2017 inventory. During the review, the Party informed the ERT that in 2015 631 kt of refinery gas was consumed (64 kt in category 1.A.1.a public electricity and heat production; 1 kt in category 1.A.2.c chemicals; 560.4 kt in category 1.A.2.g.viii other; and 5.6 kt in category 1.A.5.a stationary.) However, refinery gas was reported only in category 1.A.5.a stationary as liquid fuel. The ERT noted that this could lead to an underestimation of emissions and recommends that Belarus carefully report emissions from refinery gas combustion in all categories where it was used for all years of the time series.	Yes. Completeness
E.40	1.A. Fuel combustion – sectoral approach – all fuels – CO_2, CH_4 and N_2O	During the review, (see ID# E.14 in table 3) Belarus informed the ERT that country-specific CO_2 EFs are used for energy sector. However, the ERT noted that the 2017 NIR (p.33) reports that IPCC default EFs were used. During the review, Belarus clarified that the national data on the NCV of fuels were used for the energy sector and that this is reported in the NIR (p.33). Belarus also provided a table with country-specific data for patent fuel (country-specific NCVs of 16.59–17.37 TJ/Gg; and a country-specific EF of 27.1 kg/GJ); residual fuel oil (country-specific NCVs of 39.64–40.48 TJ/Gg; and country-specific EFs of 20.8–21.3 kg/GJ); diesel oil (country-specific NCVs of 42.44–42.71 TJ/Gg; and country-specific EFs of 19.5–19.6 kg/GJ); fuel oven household (country-specific NCVs of 41.25–42.35 TJ/Gg; and country-specific EFs of 19.9–20.4 kg/GJ); and natural gas (a country-specific NCV of 33.53 TJ/Gg; and a country-specific EF of 15.1 kg/GJ). The Party also explained that these data were obtained as a result of a research project titled "Specification or development of GHG emission factors in the energy sector" within the framework of the national scientific and technical programme, which was funded by the National Academy of Sciences of the Republic of Belarus and that areas of research are approved annually. The Party confirmed that this information will be reported in the next GHG inventory submission. The ERT further noted that country-specific parameters presented to the ERT during the review were not reported in the NIR. The NIR (p.33) only stated that national NCVs were used, without any concrete figures and explanations explaining to which fuels these parameters were applied. The ERT also noted that the use of country-specific NCVs could not be considered as	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue? If yes, classify by type
		country-specific EFs because NCVs are applied to AD, not to emission estimates. The ERT further noted that the values of the carbon content in different fuels presented by the Party during the review do not correspond to the carbon EFs reported in CRF table 1.A(b) (19.9 t/TJ for residual fuel oil; 19.55 t/TJ for gas/diesel oil; 20.1 t/TJ for fuel oven household; and 16.02 t/TJ for natural gas). The ERT recommends that the Party provide detailed information in the NIR on all country-specific parameters (NCVs, EFs, etc.) used for the inventory in the energy sector (e.g. in tabular format); explain the methodology used for the development of these parameters; provide the reference to the publications where the methodology is described in more detail; and provide justification that the country-specific parameters are more suitable for the national circumstances. The ERT also recommends that Belarus ensure the correct reporting of country-specific carbon contents in CRF table 1.A(b).	
E.41	Fuel combustion – reference approach – jet kerosene, peat – CO_2	When comparing the data from the fuel and energy balance provided by the Party in response to a request made by the ERT, the ERT noted, in addition to the issue identified in ID# E.32 in table 3, the following: (a) For jet kerosene, the import data are reported incorrectly (12 kt in the fuel and energy balance and 132.00 kt in CRF table 1.A(b) for the reference approach) (see ID# E.24 in table 3 regarding the units); (b) The carbon stock change for peat is reported with an opposite sign. The ERT recommends that Belarus correct the reporting of AD for jet kerosene imports in CRF table 1.A(b) and report the correct sign for the carbon stock change for peat (i.e. it should be negative) in CRF table 1.A(b) for the reference approach estimates.	Yes. Transparency
E.42	1.A.3.b Road transportation – liquid fuels – CO_2	The ERT noted that the IEF for CO_2 for gasoline combustion from road transportation was not constant for all years of the time series. The CO_2 IEF is equal to 69.3 t/TJ (which is the IPCC default) for the period 1990–2000, then it changes annually for the period 2001–2009, and is again equal to 69.3 t/TJ for the period 2010–2015. During the review, the Party informed the ERT that the time-series changes in the CO_2 IEF for gasoline combustion from road transportation was reported owing to the incorrect transfer of the estimates from worksheets to the CRF Reporter inventory software for the period 2001–2009. The ERT recommends that Belarus ensure that the CO_2 IEF calculated for the time series is accurate.	Yes. Consistency
E.43	1.B.2.b Natural gas gaseous fuels – CO_2 and CH_4	The ERT noted that, according to the 2006 IPCC Guidelines (table 4.2.7), the AD for category 1.B.2.b.4 gas transmission and storage can be referenced directly from national statistics using the value reported for total net supply. In addition, the data for category 1.B.2.b.5 gas distribution are equal to the amount of gas handled by gas transmission and storage systems minus exports. According to CRF table 1.A(b), total apparent consumption of natural gas in Belarus in 2015 was 641.27 PJ and exports did not occur. However, the AD reported for the category 1.B.2.b.4 gas transmission and storage in 2015 amount to more than 100 times less than the AD reported under category 1.B.2.b.5 gas distribution (4.85 PJ and 641.77 PJ, respectively) (see also ID# E.44 below). During the review, the Party explained that the AD provided by the National Concern for Oil and Chemistry were used for category 1.B.2.b.4 gas transmission and storage. These data include only conditioning, transmission and storage of natural gas produced in the country. For category 1.B.2.b.5 gas distribution, the AD provided by Belstat were used, which include the total net supply of natural gas.	Yes. Accuracy

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b]? If yes, classify by type
		The ERT recommends that, in accordance with the 2006 IPCC Guidelines, Belarus include in the AD under category 1.B.2.b.4 gas transmission and storage all gas transmitted by the pipeline system to industrial consumers or natural gas distribution systems, including both produced and imported natural gas, as well as emissions from natural gas storage systems, calculated separately. The ERT also recommends that Belarus provide detailed information in the NIR on the methodology used for the emission estimates, and justifications for the completeness of the AD.	
E.44	1.B.2 Oil and natural gas and other emissions from energy production– Oil and natural gas – CH_4	The ERT noted that the AD for the categories under 1.B.2 oil and natural gas and other are reported in PJ. The 2017 NIR (p.38) reports that Belarus used the 2006 IPCC Guidelines and default EFs to estimate fugitive emissions from oil and natural gas operations; however, the IPCC default EFs for gas categories 1.B.2.2 gas production, 1.B.2.3 processing, 1.B.2.4 transmission and storage and 1.B.2.5 distribution are provided in Gg per 10^6 m^3 of gas; and for oil categories 1B.1.2 production, 1B.1.3 transport, 1B.1.2 refining and storage and 1B.1.5 distribution they are provided in Gg per 10^6 m^3 of oil. No information is provided in the NIR on the units of the EFs used for these categories or on the methodology used to transfer the EFs from Gg per 10^6 m^3 to Gg per PJ.	Yes. Accuracy
		The ERT recommends that Belarus ensure the correctness of the units used for the AD and EFs for all categories under 1.B.2 oil and natural gas and other emissions from energy production and provide a detailed explanation for the choice of EFs.	
E.45	Feedstocks, reductants and other non-energy use of fuels – crude oil – CO_2	The ERT noted that the reported data on crude oil used for non-energy purposes and feedstock are not in line with the 2006 IPCC Guidelines. The amount of crude oil which was reported as excluded carbon is much higher than the amount of non-energy use of crude oil from the national statistical data available from the official website of Belstat (http://www.belstat.gov.by/ofitsialnaya-statistika) and the data contained in the fuel and energy balance provided by the Party. During the review, the Party confirmed that the amount of crude oil reported as non-energy use includes oil used for transformation into secondary oil fuels.	Yes. Accuracy
		The ERT recommends that Belarus recalculate the excluded carbon from non-energy use of fuels for crude oil in accordance with the 2006 IPCC Guidelines using data from the national fuel and energy balance on crude oil used for non-energy purposes and as feedstock for non-fuel products.	
IPPU			
I.12	2. General (IPPU) – all gases	In response to recommendations made in the previous review report and in response to a question raised by the ERT during the review of the 2017 submission on the timing and priorities of the planned inventory improvements, the Party explained that the common problem for the majority of issues raised during the previous and current reviews is the lack of AD and that it is planning to include the appropriate estimates and recalculations in the NIR once the required information has been obtained. The ERT notes with concern the lack of capacity of the Party's national inventory system to fulfil its reporting requirements and to respond adequately to recommendations made during reviews.	Not an issue
		The ERT encourages the Party to set up a more concrete improvement plan by including prioritized categories and a clear time frame to implement the planned improvements; and include this improvement plan in its next submission.	
	2.A.1 Cement	The ERT noted that the AD (clinker production) for category 2.A.1 decreased 14.8 per cent between 2014 (5100.30 kt) and 2015	Yes.

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ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue?[b] If yes, classify by type
	production – CO_2	(4343.00 kt). This decrease was not explained in the NIR. During the review, the Party explained that this decrease was caused by a change in the national policy on supporting new constructions. The ERT recommends that the Party enhance the clarifying information on trends of AD (and/or EFs) in the NIR, particularly to explain the decrease in AD between 2014 and 2015.	Transparency
I.14	2.A.2 Lime production – CO_2	The ERT noted that Belarus applies the lower value (0.77 t/t) of the default EF range for dolomitic lime from the 2006 IPCC Guidelines (0.77–0.86 t/t), as is appropriate for developing countries according to the 2006 IPCC Guidelines. According to the Party, the use of this lower value was suggested by a previous ERT (see 2016 ARR). The ERT encourages Belarus to increase its efforts to determine a country-specific EF and apply these country-specific values in the calculation of emission estimates.	Not an issue
I.15	2.A.3 Glass production – CO_2	The ERT noted that the Party, in response to a previous recommendation, subtracted soda ash used in glass production from category 2.A.4.b. When analysing the effect of adding this soda ash use to glass production, the ERT noted that the ratio of soda ash per mass unit of glass was variable over the years. During the review, the Party explained that a surrogate data set was applied after 2003 and that the fluctuations in the ratio of soda ash per AD of glass are caused by using these surrogate data in the estimates. The ERT recommends that the Party ensure the time-series consistency of the emissions by applying the same data source for the entire time series, or if this is not possible, apply a splicing technique from the 2006 IPCC Guidelines to ensure the consistency of the time series. The ERT recommends that the Party include information on data sources and any changes thereto in the NIR in order to increase transparency.	Yes. Consistency
I.16	2.B.1 Ammonia production – CO_2	The ERT noted a low IEF for ammonia production (1.27–1.30 t/t compared with the default range provided in the 2006 IPCC Guidelines of 1.67–3.27 t/t), especially since Belarus reported that it did not take into account CO_2 removals for urea production. During the review, the Party explained that an error was made in the calculation of the CO_2 emissions and informally provided an updated time series of the emissions and the parameters used for the calculation, which resulted in an increase in emissions. The ERT recommends that the Party correct the error in the reporting of AD and emissions from ammonia production.	Yes. Accuracy
I.17	2.B.1 Ammonia production – CO_2	In response to a recommendation made during the previous review, the Party reported in the NIR country-specific data on NCVs and carbon content to be used in the tier 2 calculation of the CO_2 emissions. However, it was not clear from the NIR whether these values were constant or varying over time. During the review, the Party explained that the values were applied to the whole time series. The ERT recommends that the Party include information on the time-series applicability of parameters used for estimating the CO_2 emissions in its NIR.	Yes. Transparency
I.18	2.B.1 Ammonia production – CO_2	The ERT noted that the Party reported in the NIR that recalculations were performed for this category in its 2017 submission (p.54). However, in CRF table 8, very small changes in CO_2 values (<0.001 kt CO_2) were reported for category 2.B.1 ammonia production for the years 1990–2014. The Party explained that recalculations for this category were performed for the whole time series because of the use of national parameters (the NCV of natural gas and the carbon content factor for natural gas) instead of	Yes. Consistency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue?[b] If yes, classify by type
		the previously used IPCC default parameters. The Party further explained that this information was not reflected in the CRF tables and indicated that this inconsistency will be corrected in the next submission. The ERT recommends that the Party ensure the QA/QC of recalculations in all categories in the IPPU sector in future submissions in order to avoid inconsistencies between the NIR and CRF table 8.	
I.19	2.B.2 Nitric acid production – N_2O	The ERT noted a time-series inconsistency in the AD between 2011 (0.78 t) and 2012 (0.11 t) for this category, which was not explained in the NIR. The 2012 value is 85.3 per cent lower than the 2011 value. During the review, the Party explained that this was due to a change in data sources for AD. The ERT recommends that the Party include information on data sources and any changes thereto in the NIR in order to increase transparency. The ERT also recommends that the Party ensure the time-series consistency of emission estimates by applying the same data source for the entire time series, or if this is not possible, apply a splicing technique from the 2006 IPCC Guidelines to ensure the consistency of the time series.	Yes. Consistency
I.20	2.B.7 Soda ash production – CO_2	The ERT noted that, based on the values reported for the AD and CO_2 emissions in CRF tables 2(I).A-Hs1, the IEF for soda ash production varies (ranging from 0.134 to 0.139), while the Party reports in the NIR (p.58) that it applied a tier 1 approach using the default EF of 0.138 t CO_2/t soda ash. During the review, the Party explained that the varying range of the IEF was due to rounding of the AD and emissions in the CRF tables to two decimals. The ERT recommends that Belarus report the precise AD and emissions data in the CRF tables.	Yes. Accuracy
I.21	2.C.1 Iron and steel production – CO_2	The Party reported in its NIR that the electric arc furnace steel manufacturing process uses direct reduction iron and cast iron as inputs (pp.63–64). However, it was not clear what the origin of these materials was. The 2006 IPCC Guidelines also provide an EF for produced direct reduction iron and cast iron; however, these potential emissions are not included in the inventory. The Party informed the ERT that these materials are not produced in Belarus but imported from the Russian Federation. The ERT recommends that the Party describe more clearly the origin of the carbon-containing materials used for direct reduction iron and cast iron used in steel-making processes in the NIR (e.g. whether the inputs are imported).	Yes. Transparency
I.22	2.C.1 Iron and steel production – CO_2	The ERT noted that the Party reported substantial recalculated emissions in CRF table 8s1 for category 2.C.1 iron and steel production but it did not mention in the NIR that it had applied a recalculation, and therefore did not provide a reason or an approach for the recalculations. The ERT recommends that the Party ensure consistency between the NIR and the CRF tables when reporting on recalculations. The ERT also recommends that – in case of a recalculation – the Party provide the rationale and assumptions applied for such recalculation in the NIR.	Yes. Transparency
I.23	2.C.1 Iron and steel production – NO_X and CO	The Party reported in its NIR that non-ferrous metal production occurs in Belarus (p.62). However, the indirect emissions were allocated under the category 2.C.1 iron and steel production. The ERT encourages Belarus to report the emissions from non-ferrous metal production in the appropriate category, namely 2.C.7 other.	Not an issue

ID[1]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue?[2] If yes, classify by type
I.24	2.D Non-energy products from fuels and solvents use – NMVOCs	The ERT noted that in the NIR the breakdown of NMVOC emissions by source (table 4.16) did not add up to the total mentioned in the same table. The Party explained that double counting had occurred, which was also reported in the CRF tables. The Party provided a corrected overview table with the correct total during the review. The ERT encourages the Party to correct table 4.16 in the NIR to ensure that the sum of NMVOC emissions reported by source is equal to the total mentioned in the same table.	Not an issue
I.25	2.E. Electronics industry – HFCs, PFCs,SF_6 and NF_3	The ERT noted that while the NIR stated that emissions from this category could not be estimated due to a lack of data (p.72), CRF table 2(I)s2 reports the emissions as "NA". The ERT recommends that the Party either estimate emissions from the electronics industry or, if this is not possible, apply the correct notation key "NE", and provide a reason in the NIR and CRF table 9 why the emissions cannot be estimated.	Yes. Completeness
I.26	2.G.1 Electrical equipment – SF_6	The ERT noted that the Party only reported operational emissions from this category in CRF table 2(II)B-Hs2 (0.11 t SF_6 in 2015). A constant leakage rate of 0.5 per cent is applied for all years of the time series, although the 2006 IPCC Guidelines (volume 3, chapter 8, section 8.2) present other default EFs (0.002 and 0.007). The Party explained that it applied the annual leakage rate provided by the supplier of the electrical equipment (the company AES-komplekt). The ERT recommends that the Party provide in its NIR the background information to support the country-specific EF for operation. The ERT also recommends that the Party increase its efforts to include emissions from installation and disposal of electrical equipment in its next submission.	Yes. Completeness
Agriculture			
A.26	3. General (agriculture)	The ERT noted that there is an inconsistency in the classification of non-dairy cattle. Table 5.4 of the NIR defines seven categories; these differ from those reported in tables 5.5, 5.7, 5.14, 5.15 and 5.16 of the NIR. During the review, the Party explained that NIR table 5.4 shows the national classification of cattle and its correspondence to the classification provided in the 2006 IPCC Guidelines. The distribution of cattle by subcategory is needed for the use of national statistics and country-specific EFs and parameters. The total number of animals and the corresponding emissions reported in the CRF tables are presented according to the classification provided in the 2006 IPCC Guidelines. The ERT recommends that Belarus ensure consistency between the cattle categories in NIR tables 5.4, 5.5, 5.7, 5.14, 5.15 and 5.16 used to calculate the N_2O and CH_4 emissions for all subcategories (CRF tables 3.As1, 3.As2, 3.B(a)s1, 3.B(a)s2 and 3.B(b)). Further, the ERT recommends that Belarus provide in the NIR a detailed description of the cattle categories used to estimate emissions, ensuring consistency between the CRF tables and the NIR.	Yes. Transparency
A.27	3. General (agriculture) – all gases	The ERT noted that the Party has not included the references for the data sources for the uncertainty values reported in the agriculture sector. During the review, the Party explained that the main source of the information for the default data on uncertainties is the 2006 IPCC Guidelines. The country-specific EF uncertainties were not calculated separately, and the values were applied as for the default EFs. The uncertainties for the country-specific data on animal population were applied according to the estimates of Belstat. Belarus informed the ERT that it will improve the description on uncertainties in the NIR, as well as	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue?[b] If yes, classify by type
		on calculated combined uncertainties for country-specific EFs for manure management, in the next submission. The ERT recommends that Belarus include in the NIR references to the data sources of the uncertainty values in all relevant sections where uncertainty values are reported.	
A.28	3. General (agriculture) – CH_4 and N_2O	The ERT noted that the Party reported in CRF tables 3.As1 and 3.B(a)s1 data for goats and horses under the category other (sheep). As a result, in CRF table 3.B(a)s2, the CRF Reporter automatically assumes that goats and horses are a subcategory of sheep, and therefore the headings in the column which refers to climate region after row 40 refer to a mixture of livestock categories (e.g. "Goats – Sheep"; "Horses – Sheep"). The ERT notes that under the category "sheep" only types of sheep should be reported. AD and emissions from goats and horses should be reported under categories 3.A.4 and 3.B.4 other livestock, respectively. The ERT recommends that Belarus report the AD and emissions for goats and horses under other livestock in CRF tables 3.As1 and 3.B(a)s1, respectively.	Yes. Comparability
A.29	3.B Manure management – CH_4	The ERT noted that the Party reports volatile solids and CH_4 production potential as "NE" for fur-bearing animals in CRF table 3.B(a)s1. During the review, the Party explained that these parameters are not applied in its calculation of CH_4 emissions from manure and stated that it will revise the notation keys in the next submission for the entire time series. The ERT recommends that the Party revise the notation keys used for volatile solids and CH_4 production potential in CRF table 3.B(a)s1 for fur-bearing animals.	Yes. Transparency
A.30	3.B Manure management – N_2O	The ERT noted that in CRF table 3.B(b), N leaching from manure management has not been estimated (the Party reports "NE"). During the review, the Party explained that it acknowledges that some quantity of N may be leached from storage sites of solid manure where manure is kept for a short period of time and then applied to soils. As the Party estimates indirect N_2O emissions from N leaching from manure management, meaning that leaching of N occurs due to the application of manure to soils and from grazing animals at pasture, range and paddock, it considers that the accounting of manure that may be leached from MMS together with the accounting from application of manure to soils leads to double counting. Further, the Party stated that indirect N_2O emissions are not estimated because there are no country-specific data on the fraction that is leached. According to the 2006 IPCC Guidelines, indirect N_2O emissions should be assessed in cases where country-specific data on the fraction that is leached are available. The ERT encourages the Party to estimate indirect N_2O emissions from N leaching from manure management as described in the 2006 IPCC Guidelines (volume 4, chapter 10, equations 10.28 and 10.29) and report the emissions and underlying information in the CRF tables and the NIR in line with the 2006 IPCC Guidelines in the next submission. As this estimate requires country-specific data to develop a tier 2 method, the ERT recommends that, if no data are available for Belarus, the Party use expert judgment to develop the necessary input data, for example, by considering data from neighbouring countries with similar climate and MMS.	Yes. Accuracy
A.31	3.B Manure management–	The ERT noted that the methodology used for deriving the fractions of manure in different MMS was not provided in the NIR (table 5.15) and the values reported in the NIR are not consistent with those reported in CRF table 3.B(a)2 for non-dairy cattle. For example, it is not clear how, for non-dairy cattle, the data under "storage in a solid form" in the same table were averaged	Yes. Accuracy

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue?[b] If yes, classify by type
	CH_4	and used for the estimation of emissions. During the review, the Party explained that the values in table 5.15 of the NIR are correct and that it will make changes in CRF table 3.B(a)2 in the next submission. Belarus explained that in chapter 5.3.2 of the NIR it provided the methodology used to derive the values of manure allocated to the different MMS for non-dairy cattle. The Party also explained that data on the distribution of manure per MMS are based mainly on expert judgment, which is supported by the national norms and standards for manure management in the country. The main approaches for this judgment are described in the section of the NIR on the distribution of manure per MMS. The ERT finds that the derivation of the manure allocations is not adequately described in the NIR and recommends that Belarus provide: detailed information in the NIR on the methodology applied to derive the fractions of manure in the different management systems that are consistent with the values reported in CRF table 3.B(a)2 and references for the sources of AD reported in table 5.15 of the NIR. The ERT also recommends that Belarus insert the correct values in CRF table 3.B(a)2. Furthermore, the ERT encourages the Party to include references for the sources of AD for all tables as footnotes.	
A.32	3.B.4 Other livestock – CH_4	The ERT noted that the Party described the method used to estimate poultry population in section 5.2 of the NIR, although the methodology for estimating CH_4 emissions from enteric fermentation from poultry is not provided in the 2006 IPCC Guidelines. The Party does estimate CH_4 emissions from manure management from poultry. However methodological information on the calculation of the population is not provided in the corresponding section of the NIR. The ERT recommends that the Party describe the poultry population in section 5.3 of the NIR on manure storage and use.	Yes. Transparency
A.33	3.B Manure management – N_2O	The ERT noted that the averages for Nex provided in NIR table 5.16 do not correspond to the average of the values provided in the same table for the subcategories for both cattle and pigs. During the review, the Party explained that the average values for pigs and cattle differ from year to year. The data provided in NIR table 5.16 correspond to the data from the 2017 submission for 2015. The ERT recommends that the Party provide details in the NIR on the methodology used to estimate averages of the N content in manure for non-dairy cattle and swine.	Yes. Transparency
A.34	3.B Manure management – N_2O	The ERT noted that the Party reported in NIR table 5.18 a value for the fraction of volatile N for liquid systems for non-dairy cattle, which is not provided in table 10.22 of the 2006 IPCC Guidelines ($Frac_{GASM}$). The Party also reported the fraction of N lost from dairy cattle manure kept in liquid systems in the same table of the NIR, even though it reported the notation key "NO" for this category in CRF table 3.B(b). Similarly, in table 5.25 of the NIR, a value for $Frac_{LOSS}$ for "other cattle" is provided for liquid systems, which is not provided in table 10.23 of the 2006 IPCC Guidelines. During the review, the Party explained that the manure distribution, storage and use systems are described in the NIR (p.103). Liquid MMS for other cattle are used in Belarus. The $Frac_{LOSS}$ values for other cattle (0.4 for liquid or dry lot and 0.5 for solid storage) were taken from the default range in table 10.22 of the 2006 IPCC Guidelines. The ERT still finds that there are inconsistencies in the $Frac_{GASM}$ and $Frac_{LOSS}$ values provided in tables 5.18 and 5.25 of the NIR which are not in line with the values provided in corresponding tables 10.22 and 10.23 of the 2006 IPCC Guidelines. The ERT recommends that, in the NIR, Belarus describe the MMS for all cattle categories in detail, providing references to the sources of the information. The ERT further recommends that Belarus apply values for the fraction of volatile N in line with the	Yes. Accuracy

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue?[b] If yes, classify by type
		2006 IPCC Guidelines and ensure that the values in the NIR are consistent with the information provided in CRF table 3.B(b). The choice of values from the tables provided in the 2006 IPCC Guidelines should be justified with references. The ERT further recommends that the Party check the consistency between NIR tables 5.18 and 5.25 and the CRF tables.	
A.35	3.D Agricultural soils – N_2O	The ERT noted that in the section of the NIR titled "Emissions of N_2O from grazing" (p.114), there is reference to tables 6.6, 6.7 and 6.17 that is not correct; instead it should reference to tables 5.6, 5.7 and 5.17. A similar issue occurs in section 5.4.3 of the NIR (p.116) where a reference to table 10.22 is not correct; instead it should be table 5.22. During the review, the Party acknowledge that references were not correctly provided and confirmed that it would correct the references in the next submission. The ERT recommends that Belarus improve its QA/QC checks of the NIR to ensure that tables are correctly referenced, in particular regarding tables 5.6, 5.7, 5.17 and 5.22.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
A.36	3.D Agricultural soils – N_2O	The ERT noted that in section 5.4.3 of the NIR the Party provides a reference to table 10.22 of the 2006 IPCC Guidelines as the source of the uncertainties of the coefficients associated with application of N to soils in category 3.D agricultural soils, but without providing further information on how the values (ranges) provided in table 10.22 were used to quantify the uncertainties. During the review, the Party explained that the incorrect reference was presented and that it should be table 11.3. The Party confirmed that this mistake will be corrected in the next NIR. The ERT recommends that Belarus provide the reference to the correct table from the 2006 IPCC Guidelines for the uncertainties of the coefficients associated with N loss due to volatilization (i.e. table 11.3).	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
A.37	3.D Agricultural soils – N_2O	The ERT noted that the Party refers to section 5.3 of the NIR to explain the recalculations described in section 5.4.5 of the NIR. The ERT finds that there is insufficient information on the recalculations made to the annual amount of N released in the manure. During the review, the Party explained that in the previous NIRs it used Nex values for fur-bearing animals and rabbits (1.5 and 4.7 kg N/head/year, respectively). The Nex values are derived based on animal mass using data from the 2006 IPCC Guidelines (i.e. with multiplication by animal mass values). Following the recommendations of the ERT, the Party used the default Nex value for mink and polecats (4.59 kg N/head/year) and for rabbits (8.10 kg N/head/year) (i.e. without multiplication by animal mass values) provided in table 10.19 of the 2006 IPCC Guidelines. Section 5.3.5 of the NIR provides a short description of all recalculations made in the 2017 submission. Further, the Party explained that the recalculations were caused by rounding errors, print errors in the data and emissions which were indicated during QC checks, as well as by the correctness of the Nex values for fur-bearing animals and rabbits in response to the recommendations made by the previous ERT. The same methodologies were used for the recalculations as in the previous submission. The recalculations caused by the correctness of the Nex values were applied to the whole time series using the same methodology. As a result of the recalculations, CH_4 emissions from manure management decreased insignificantly by 0.00002 per cent for 1990 and by 0.002 per cent for 2014, while N_2O emissions decreased by 27.39 per cent and 29.48 per cent for 1990 and 2014, respectively. The ERT encourages the Party to present the effect of the changes in tables in the relevant sections, showing emissions before and after the recalculations were made.	Not an issue
A.38	3.H Urea	The ERT noted that a reference to the uncertainty value used for CO_2 emissions from urea is not provided in section 5.6 of the	Yes.

ID[2]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue?[a] If yes, classify by type
	application – CO_2	NIR. During the review, the Party explained that the reference will be provided in the next NIR. The ERT recommends that the Party improve the transparency of the uncertainty values used for urea production by providing the relevant references for the uncertainty value in the NIR in line with the UNFCCC Annex I inventory reporting guidelines.	Transparency
LULUCF			
L.9	4. General (LULUCF) – CO_2, CH_4 and N_2O	During the review, Belarus explained that it intends to estimate all missing categories using at least a tier 1 approach, provide an uncertainty analysis, implement QA/QC procedures for each estimated category, and conduct an internal technical review to ensure consistency between the NIR and the CRF tables (see ID# L.1 in table 3). The ERT commends Belarus for its improvements to date and its plans to further improve the LULUCF inventory. To assist ERTs in understanding when Belarus intends to implement each improvement, the ERT recommends that Belarus provide detailed information on all the planned improvements in section 6.1.7 of the NIR with accompanying time frames.	Yes. Transparency
L.10	4. General (LULUCF) – CO_2, CH_4 and N_2O	During the review, the ERT noted difference in the AD of total forest land area reported in the NIR (table 6.5, p.152) compared with CRF table 4.1. The ERT recommends that Belarus correct the inconsistency between the information on total forest land area provided in the NIR (table 6.5, p.152) and in CRF table 4.1.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
L.11	Land representation – CO_2	During the review, the ERT asked Belarus to clarify where the emissions, removals and AD are reported for "lands under trees and shrubs (plantings)". Belarus explained that "lands under trees and shrubs (plantings)" are classified as forest land or cropland depending on whether the land is included in the forest fund or is for agricultural land use. To increase the transparency and understanding of how land use in Belarus is categorized, the ERT recommends that Belarus provide detailed information in the NIR (e.g. in section 6.2) explaining where the land area for "lands under trees and shrubs (plantings)" is represented.	Yes. Transparency
L.12	Land representation – CO_2, CH_4 and N_2O	Based on a recommendation from the 2016 review, Belarus included in its 2017 submission a description of how the national land-use categories are linked to the IPCC land-use categories (see ID# L.2 in table 3). To further assist transparency, the ERT recommends that Belarus apply the same correlation between country-specific land-use categories and IPCC land-use categories used in table 6.2 to table 6.3 in the NIR.	Yes. Transparency
L.13	4.B.2 Land converted to cropland – CO_2	For 2015, Belarus reported around 392,009 hectares of land converted to cropland in CRF table 4.B. However, the emissions and removals from this category have not been estimated. Belarus explained during the review that it plans to recalculate the land areas, taking into account the 20-year conversion period for land from one category to another, and that the preparation of the land conversion matrices was the first step in improving reporting on the LULUCF sector and this work will be continued. The ERT welcomes the improvement in reporting on the land-use area and land-use transitions. The ERT recommends that Belarus include this in the inventory improvement plan (section 6.1.7 of the NIR).	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue?[a] If yes, classify by type*
L.14	4.G Harvested wood products – CO_2	Belarus reported an increase in forest harvest/logging since 1990 (section 6.17 of the NIR) and the annual change in carbon in HWP stocks is likely to be significant. The ERT noted that emissions and removals from HWP have not been estimated in the NIR. During the review, Belarus informed the ERT that it does not currently have sufficient information for the entire time series, but that it is in the process of collecting the appropriate information to report HWP. The recommendation related to this issue is already included in ID# G.3 in table 3.	Yes. Completeness
Waste			
W.12	5. General (waste)	The ERT noted that there is no description in the NIR on the waste management practices used in Belarus except that around 90 per cent of MSW are landfilled. During the review, Belarus explained that up to 10 per cent of MSW is recycled and only in the last few years the amount of MSW recycled has increased up to 12 per cent and there is no composting and incineration of MSW in the country. The ERT also noted that in the NIR (p.195) the Party states that up to 100,000 t of MSW are treated biologically at the Brest waste processing plant. The ERT recommends that Belarus describe in the NIR the waste management practices used in the country.	Yes. Transparency
W.13	5.A Solid waste disposal on land – CH_4	The ERT noted that the value of the parameter for DOC of 17.79 per cent (based on the morphological composition of MSW in 2007) remains constant across the time series. If a constant value is used, the emission estimates do not capture the changing waste composition over the time series. According to the 2006 IPCC Guidelines, it is good practice to use DOC values consistently in accordance with the way in which the waste composition data are derived. During the review, the Party explained that the morphological composition of waste is surveyed by local executive and administrative bodies in every district at least once every five years. The latest in-depth survey for 2010 covered only six cities of the country and therefore the morphological composition of MSW in 2007 was used in the calculations. The ERT recommends that Belarus calculate DOC for the entire time series based on the morphological composition of MSW disposed of at SWDS and revise the CH_4 emission estimates accordingly.	Yes. Accuracy
W.14	5.A Solid waste disposal on land – CH_4	The ERT noted that, according to Belstat, waste is generated from agriculture, hunting and forestry, fishing, manufacturing and other sectors that contain DOC and fossil carbon. The industrial wastes which are expected to contain DOC and fossil carbon should be considered for the purpose of the emission estimates for waste. During the review, Belarus explained that Belstat reports industrial waste generation AD from 2005 onward and a way of gathering AD for the years prior to 2005 will be considered. The ERT recommends that Belarus collect and update information on industrial waste generation, using surrogate data or other methods, and estimate CH_4 emissions from landfilling of industrial waste for the entire time series.	Yes. Consistency
W.15	5.A.2 Unmanaged waste disposal sites – CH_4	Belarus reported in the NIR (p.195) that recalculations were made to this category owing to the revision of MSW generation AD for the entire time series with no further explanations. The ERT noted that, as a result of the recalculations, CH_4 emissions increased by 13.9 per cent in the base year and decreased by 35.1 per cent in 2014. Belarus explained that Belstat started publishing MSW generation AD in 2005 and for the years 1990–2004 the AD remained unchanged. The MSW generation AD for 1990 are taken from two national SWDS inventories, one conducted in 1989 by the Ministry of Housing and Communal Services and another conducted in 1992 by the Institute for Problems of Natural Resources Use and Ecology. The Belarus	Yes. Consistency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue?[a] If yes, classify by type
		Scientific and Research Centre "Ecology" has been carrying out more detailed studies on the annual amount of MSW disposed of since 1995. Also, the Party explained that the values of the parameters of DOC (18.38) and MCF (0.64) that were applied in the previous GHG inventory submission were changed to 17.79 and 0.6, respectively. The ERT considers that using several sources of AD for MSW generation for the years 1990–2004 and 2005–2015 with a drop in MSW generation from 3,371.2 kt in 2004 to 2,812 kt in 2005 leads to time-series inconsistencies. Further, the ERT considers that applying lower values for the parameters of DOC and MCF in the 2017 submission should not lead to an increase in the emission estimates in the base year. The ERT recommends that Belarus revise and update the MSW generation AD to ensure consistency across the entire time series and revise the CH_4 emission estimates. The ERT also recommends that the Party describe in the NIR the MSW generation AD that are used for estimating CH_4 emissions.	
W.16	5.B. Biological treatment of solid waste – CH_4 and N_2O	In the NIR (p.195), the Party mentions that up to 100,000 t of MSW are treated biologically. During the review, Belarus explained that the Brest waste processing plant has treated MSW mechanically and biologically since 2012. The Party confirmed that a request will be sent to the plant to obtain information on the amounts of MSW treated and the treatment technologies in use and the emissions will be estimated for this category. The recommendation related to this issue is already included in ID# G.3 in table 3.	Yes. Completeness
W.17	5.D.2 Industrial wastewater – CH_4	According to NIR tables 7.6 and 7.7, Belarus estimated CH_4 emissions from industrial wastewater generated only by nine types of industrial production. The ERT noted that, according to Belstat, in 2015 113,600 t of butter, 1,963,000 t of whole milk dairy products in milk equivalent and 180,800 t of cheese (excluding processed cheese) were manufactured. The ERT also noted that in 2015 266,000 t of sausages were manufactured but this amount is not included in meat and poultry production. During the review, Belarus explained that it will include those amounts in the calculation of emissions from industrial wastewater for the entire time series. The ERT recommends that Belarus include wastewater generated by dairy and sausage industries in the total wastewater outflow and revise the CH_4 emission estimates for industrial wastewater for the entire time series.	Yes. Accuracy

[a] Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines. Encouragements are made to the Party to address all findings not related to such issues.

Annex I

Overview of greenhouse gas emissions and removals for Belarus for submission year 2017, as submitted by Belarus

Table 6 shows total GHG emissions, including and excluding LULUCF and, for Parties that have decided to report indirect CO_2 emissions, with and without indirect CO_2. Tables 7 and 8 show GHG emissions reported under the Convention by Belarus by gas and by sector, respectively.

Table 6
Total greenhouse gas emissions for Belarus, 1990–2015
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions*[a]	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*
1990	115 809.96	136 914.91	NA	NA
1995	54 209.01	83 118.52	NA	NA
2000	48 039.95	81 282.71	NA	NA
2010	53 756.60	93 882.99	NA	NA
2011	56 368.06	93 945.36	NA	NA
2012	61 600.24	93 628.29	NA	NA
2013	59 611.67	94 733.28	NA	NA
2014	63 552.54	93 660.52	NA	NA
2015	62 198.07	89 607.64	NA	NA

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.
[a] The Party has not reported indirect CO_2 emissions in CRF table 6.

Table 7
Greenhouse gas emissions by gas for Belarus, excluding land use, land-use change and forestry, 1990–2015
(kt CO_2 eq)

	CO_2[a]	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3
1990	100 663.01	19 704.28	16 547.63	NO, NA	NO, NA	NO, NA	NE, NA, NO	NO, NA
1995	56 211.28	15 530.27	11 376.96	NO, NA	NO, NA	NO, NA	0.00000008	NO, NA
2000	53 950.73	15 162.14	12 169.73	NO, NA	NO, NA	NO, NA	0.10	NO, NA
2010	62 300.59	17 888.06	13 692.24	NO, NA	NO, NA	NO, NA	2.10	NO, NA
2011	61 806.46	17 670.67	14 465.92	NO, NA	NO, NA	NO, NA	2.30	NO, NA
2012	61 533.72	17 926.73	14 165.39	NO, NA	NO, NA	NO, NA	2.46	NO, NA
2013	62 099.61	18 532.19	14 098.97	NO, NA	NO, NA	NO, NA	2.51	NO, NA
2014	61316.53	18 485.30	13 856.26	NO, NA	NO, NA	NO, NA	2.43	NO, NA
2015	57 023.99	19 063.73	13 517.40	NO, NA	NO, NA	NO, NA	2.52	NO, NA
Per cent change 1990–2015	**–43.4**	**–3.3**	**–18.3**	**NA**	**NA**	**NA**	**NA**	**NA**

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.
[a] Belarus did not report indirect CO_2 emissions in CRF table 6.

Table 8
Greenhouse gas emissions by sector for Belarus, 1990–2015
(kt CO_2 eq)

	Energy	IPPU	Agriculture	LULUCF	Waste	Other
1990	96 811.92	4 406.38	32 109.05	–21 104.96	3 587.57	NO
1995	54 868.34	2 664.90	22 419.11	–28 909.51	3 166.16	NO
2000	52 510.10	3 335.63	21 111.05	–33 242.76	4 325.93	NO
2010	58 798.00	5 106.86	23 568.39	–40 126.39	6 409.74	NO
2011	58 271.19	5 095.80	24 317.97	–37 577.30	6 260.40	NO
2012	57 708.58	5 257.44	24 351.71	–32 028.06	6 310.56	NO
2013	58 600.46	5 360.67	23 794.69	–35 121.61	6 977.47	NO
2014	57 120.52	5 716.56	23 707.00	–30 107.98	7 116.44	NO
2015	53 128.36	5 252.05	23 714.31	–27 409.57	7 512.94	NO
Per cent change 1990–2015	**–45.1**	**19.2**	**–26.1**	**29.9**	**109.4**	**NA**

Notes: (1) Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions. (2) Belarus did not report indirect CO_2 emissions in CRF table 6.

Annex II

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the 2006 IPCC Guidelines that were reported as "NE" or for which the ERT otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

(a) CO_2, CH_4 and N_2O emissions from category 1.B.2.a.1 exploration (oil) (see ID#G.3 in table 3);

(b) CO_2 and CH_4 emissions from categories 1.B.2.b.1 exploration (natural gas) and 1.B.2.b.3 processing (natural gas); and CO_2, CH_4 and N_2O emissions from category 1.B.2.c venting and flaring (see ID#s G.3 and E.31 in table 3);

(c) CO_2 emissions from 1.B.2.a.5 distribution of oil products and 1.B.2.b.5 gas distribution (see ID# E.22 in table 3);

(d) CO_2 emissions from biomass consumption in categories 1.A.1. and 1.A.2. (see ID# E.38 in table 5);

(e) CO_2, CH_4 and N_2O emissions from combustion of refinery fuel gas in categories 1.A.1.a, 1.A.2.c, 1.A.2.g.viii and 1.A.5.A (see ID# E.39 in table 5);

(f) CO_2 emissions from category 2.A.4.a ceramics, category 2.D.1 lubricant use and category 2.D.2 paraffin wax use (see ID# G.3 in table 3);

(g) CO_2, CH_4 and N_2O from category 2.D non-energy products from fuels and solvents use (see ID# I.11 in table 3);

(h) HFCs, PFCs, SF_6 and NF_3 from category 2.E electronics industry (see ID# I.25 in table 5);

(i) HFC, PFC, SF_6 and NF_3 emissions from category 2.F product uses as substitutes for ozone-depleting substances (subcategories 2.F.1 refrigeration and air conditioning, 2.F.2 foam blowing agents, 2.F.3 fire protection and 2.F.4 aerosols) (see ID#s G.3 and I.4 in table 3);

(j) SF_6 emissions from category 2.G.1 manufacturing and disposal of electrical equipment (see ID# I.26 in table 5);

(k) CH_4 and N_2O emissions from enteric fermentation and manure management of asses (see ID#s G.3 and A.9 in table 3);

(l) CH_4 emissions from manure management from category 3.B(a)s1 volatile solids and maximum methane-producing capacity for manure for fur-bearing animals (see ID#s G.3 in table 3);

(m) CO_2 emissions and removals from all pools under categories 4.A.2.1 cropland converted to forest land, 4.A.2.2 grassland converted to forest land, 4.A.2.3 wetlands converted to forest land, 4.A.2.5 other land converted to forest land, 4.B.2.1 forest land converted to cropland, 4.B.2.2 grassland converted to cropland, 4.B.2.3 wetlands converted to cropland, 4.B.2.4 settlements converted to cropland, 4.B.2.5 other land converted to cropland, 4.C.2.1 forest land converted to grassland, 4.C.2.2 cropland converted to grassland, 4.C.2.3 wetlands converted to grassland, 4.C.2.5 other land converted to grassland, 4.D.1.3 other wetlands remaining other wetlands, 4.D.2.3 land converted to other wetlands, 4.E.1 settlements remaining settlements (organic soils only), 4.E.2 land converted to settlements, 4.F.2 land converted to other land and 4.G harvested wood products (see ID#s G.3, L.1 and L.6 in table 3 and L.14 in table 5);

(n) CH_4 emissions from categories 4.E.1 settlements remaining settlements and 4.E.2 land converted to settlements; N_2O emissions from categories 4.B.2 land converted to

cropland, 4.C.2 land converted to grassland, 4.D.1 wetlands remaining wetlands, 4.E.1 settlements remaining settlements, 4.E.2 land converted to settlements and 4.F other land; and CO_2, CH_4 and N_2O from category 4(II) emissions and removals from drainage and rewetting and other management of organic and mineral soils (see ID# G.3 in table 3);

(o) CH_4 emissions from wastewater sludge under category 5.A.1 managed waste disposal sites (see ID#s G.3 and W.4 in table 3);

(p) CH_4 and N_2O emissions from category 5.B biological treatment of solid waste (see ID#s G.3 in table 3 and W.16 in table 5);

(q) CO_2, CH_4 and N_2O emissions from category 5.C incineration and open burning of waste (see ID#s G.3 and W.1 in table 3);

(r) CH_4 emissions from category 5.D.1 domestic wastewater (see ID#s G.3 in table 3).

Annex III

Documents and information used during the review

A. Reference documents

Reports of the Intergovernmental Panel on Climate Change

IPCC. 1997. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. JL Houghton, LG Meira Filho, B Lim, et al. (eds.). Paris: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency. Available at https://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html.

IPCC. 2000. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. J Penman, D Kruger, I Galbally, et al. (eds.). Hayama, Japan: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency/Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/gp/english/.

IPCC. 2003. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. J Penman, M Gytarsky, T Hiraishi, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html.

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl.

IPCC. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Available at http://www.ipcc-nggip.iges.or.jp/public/wetlands/.

Annual review reports

Reports on the individual review of the 2012, 2013, 2015 and 2016 inventory submissions of Belarus, respectively, contained in documents FCCC/ARR/2012/BLR, FCCC/ARR/2013/BLR, FCCC/ARR/2015/BLR and FCCC/ARR/2016/BLR.

Other

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at http://unfccc.int/resource/webdocs/agi/2017.pdf.

Annual status report for Belarus for 2017. Available at http://unfccc.int/resource/docs/2017/asr/blr.pdf.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Kristina Gonchar and Mr. Ivan Narkevitch (Department of International Projects of the Belarus Scientific and Research Centre "Ecology"), including additional material on the methodology and assumptions used.